



An illustrated catalogue of the type specimens of Lepidoptera (Insecta) housed in the Zoological Museum Hamburg (ZMH): Part I. superfamilies Hepialoidea, Cossoidea, and Zygaenoidea

Reza Zahiri^{1,2}, Gerhard Tarmann³, Konstantin A. Efetov⁴, Hossein Rajaei⁵, Maryam Fatahi¹, Matthias Seidel¹, Birgit Jaenicke^{1,6}, Thure Dalsgaard¹, Marcy Sikora¹, Martin Husemann¹

1 *Centrum für Naturkunde, University of Hamburg, Martin-Luther-King Platz 3, 20146 Hamburg, Germany*

2 *Canadian Food Inspection Agency (CFIA), Ottawa Plant Laboratory, Entomology Laboratory, Bldg. 18, 960 Carling Ave., Ottawa, ON K1A 0C6, Canada*

3 *Naturwissenschaftliche Sammlungen, Sammlungs- und Forschungszentrum der Tiroler Landesmuseen, Ferdinandeum, Krajin-Strasse 1, 6060 Hall, Austria*

4 *Laboratory of Biotechnology and Department of Biological Chemistry, V. I. Vernadsky Crimean Federal University, RU-295051, Simferopol, Russia*

5 *Department Entomology, State Museum of Natural History Stuttgart, Rosenstein 1, 70191 Stuttgart, Germany*

6 *Museum für Naturkunde, Invalidenstraße 43; 10115 Berlin, Germany*

<http://zoobank.org/DEAAFC26-3BF6-4BAE-9477-135FC015082A>

Corresponding author: Reza Zahiri (reza.zahiri@uni-hamburg.de; reza.zahiri@canada.ca)

Academic editor: Danilo Harms ♦ **Received** 14 December 2020 ♦ **Accepted** 3 March 2021 ♦ **Published** 22 March 2021

Abstract

Zoological collections remain the main archive of animal biodiversity on Earth, and especially in times of large-scale declines of many groups represent important resources for biodiversity and conservation research. The most important individuals of these collections are the type specimens, which represent the original and unique reference for a species. While a full digitization of most museum collections currently remains utopic, lists of types are an essential resource for researchers to perform taxonomic revisions. Here, we provide an updated type catalogue of the lepidopteran superfamilies Hepialoidea, Cossoidea and Zygaenoidea deposited in the Zoological Museum of Hamburg (ZMH). In this paper, we report 259 specimens labelled as “types” belonging to 36 infrasubspecific taxa (invalid under the ICZN codes), 34 subspecies (16 of valid status) and 13 species (all of valid status). We present a full bibliography of the original descriptions and illustrations for all taxa, aiming to provide a comprehensive taxonomic guide to this collection.

Key Words

Biodiversity, CeNak, Herbert Weidner, ZMH, digitization, Georg Warnecke, Hanan Bytinski-Salz

Introduction

Natural history collections are the main archives of biodiversity. They focus on collecting, maintaining and documenting natural specimens, a crucial task in times of biodiversity decline. The Zoological Museum of Hamburg (ZMH) holds large collections across all animal groups. With approximately five million specimens

and several thousand primary types, the entomological collection is among the most important natural history archives in Germany.

The origins of the current collection of the Zoological Museum Hamburg (ZMH) can be traced back to the first half of the 19th century, as a result from the initiative and interest in natural history of local civilians, merchandisers, traders, and owners of seagoing vessels

(Glaubrecht 2018). However, much of the collections of holometabolous insects were destroyed by the incendiary bombing of Hamburg in 1943 (Weidner 1979). Thus, as all documents such as entry books, counting lists and card catalogs were lost and the former magnitude of the collection remains difficult to describe. However, much of the earlier new entries after WW2 are described in Weidner (1974), with the largest and most important collections which have been obtained being those of Georg Warnecke (1943 and 1963), Richard Jänig (1949), Fritz Diehl (1950–1972), Hermann Rödinger (1952), the Jungius Gesellschaft (1956), Hanan Bytinski-Salz (1960), Eduard Feldtmann (1960), Günter Albers (1972), the Altona Museum (1965, 1973, 1976), and Mathilde Linz (1974). More recently the largest newly obtained collections were those of Hans-Jürgen Kelm (2003), Walter Baltruweit (2013), Jörg Roloff (2014), Thomas Tischler (2017), Bernd Heinze (2020), and Karl-Heinz Müller-Köllges (2020). Besides these large collections, many medium and small collections were obtained by the museum. Hence, despite the considerable loss in WW2, presently the ZMH hosts ca. 5 million insect specimens, being placed among the five largest entomological collections in Germany. About 1 million specimens represent the Lepidoptera. However, despite their importance, the entomological collections in Hamburg are not well documented, nor digitized.

Herbert Weidner, a former curator of the collection had published an important series of papers from the 60s until the late 70s, where he documented the collections in much detail (first catalogue – Weidner 1962, last catalogue – Weidner 1979, and the Lepidoptera catalogue Weidner 1974). However, since the work of Weidner more than 40 years have passed without further documentation. Further, Weidner's catalogues were all published in German, hence, are difficult to access for international researchers and lack family group classification, making it difficult to work with them. Therefore, a comprehensive effort to revise the type catalogues has been initiated to give an update on the type material housed in the ZMH in English language (Sartori et al. 2016; Dey and Husemann 2018a, b, Harms and Dupérré 2018; Monod et al. 2019; Henningsen et al. 2020; Simoes et al. in press).

To make the Lepidoptera collection more accessible to researchers, we performed a detailed inventory initiated by Hossein Rajaei in 2013. As a part of this inventory, the whole collection was thoroughly searched and types were moved to a separate, specially protected type collection. All type specimens were compared with the original descriptions, photographed, databased and relabeled, if required. The original high-quality photographs are available online through the FUNDus! Portal of the University of Hamburg (<https://www.fundus.uni-hamburg.de/>). The complete data of the type material is provided as a table (Suppl. material 1: Table S1) in this catalogue.

Material and methods

Photography. All images were taken with a digital imaging system with stacking capabilities. The images were either taken with a Canon EOS 5DSR with a 65 mm or 100 mm lens and stacked with Zerene Stacker (PMax algorithm) or with a Canon EOS 6D with a 55 mm or 65 mm lens and stacked with Helicon Focus 5.3.

Taxonomy. All taxonomic changes were made after studying the relevant original description of the type material. Synonyms that have already been proposed are listed and the type material was examined. Classification used herein follows van Nieuwerkerken et al. (2011). The taxonomy of the family Zygaenidae is following the last revisions of the family (Hofmann and Tremewan 1996; Efetov 2001; Efetov and Tarmann 1995, 2017). For a full list of synonyms, please refer to the above-mentioned catalogues.

Type and original specimen material. Type and original specimen localities are cited in their original spelling or with additional remarks (in square brackets), if required. All data are transcribed verbatim as they appeared on the respective labels. For unreadable data a question mark (?) is used. Double slash (//) separates data on different labels, a single slash (/) separates lines within each label, and semi-colon (;) separates different specimens. Additional comments are placed in square brackets.

The ICZN (1999) terminologies (e.g., holotype, syntype, lectotype, neotype, paratype, paralectotype, allotype, cotype and etc.) are available at the ICZN website (<http://iczn.org/content/Glossary>) and articles cited in the text can be found below:

Infrasubspecific taxon – a taxon at lower rank than that of subspecies. The names of such taxa are not regulated by the Code.

Article 45.6.1. – A name is infrasubspecific if its author expressly gave it infrasubspecific rank, or if the content of the work unambiguously reveals that the name was proposed for an infrasubspecific entity;

Article 45.6.2. – A name is deemed to be infrasubspecific if its author used one of the terms “aberration”, “ab.” or “morph”.

Article 45.6.3. – A name is deemed to be infrasubspecific if it was first published after 1960 and the author expressly used one of the terms “variety” or “form” (including use of the terms “var.”, “forma”, “v.” and “f.”);

Article 45.6.4. – A name is subspecific if first published before 1961 and its author expressly used one of the terms “variety” or “form” (including use of the terms “var.”, “forma”, “v.” and “f.”), unless its author also expressly gave it infrasubspecific rank, or the content of the work unambiguously reveals that the name was proposed for an infrasubspecific entity, in which case it is infrasubspecific;

Article 72.7. – Name-bearing types of nominal species-group taxa denoted by new replacement names (nomina nova). If an author proposes a new spe-

cies-group name expressly as a replacement (a nomen novum) for an earlier available one, then the two names are objective synonyms; both the nominal taxa they denote have the same name-bearing type despite any simultaneous restriction or application of the new replacement name (nomen novum) to particular specimens or any contrary designation of type, or any different taxonomic usage of the new replacement name.

Type specimens deposited at the Zoological Museum Hamburg (ZMH)

Superfamily Hepialoidea Stephens, 1829

Hepialoidea (the ghost moths and their relatives), with 629 described species worldwide, is the earliest diverging lepidopteran clade to exhibit any significant degree of species diversity today (Nielsen et al. 2000). The family Hepialidae is the most diverse group among other five families within the superfamily and comprises 606 species in 62 genera. In contrast to the remainder of the pre-Ditrysian Lepidoptera, many of the species are large and spectacular moths (Nielsen et al. 2000).

Family Hepialidae Stephens, 1829

1. *Phymatopus hecta* ab. *inversa* (Bytinski-Salz, 1939)

Hepialus hecta ab. *inversa* Bytinski-Salz, 1939: Ent. Rec. 51: 85.

Original material examined. Labelled as “Holotype” (ZMH 61345), 1♀ “St. Amata / Lettland / 16.7.1933 / leg. W. Brandt // *Hepialus* / *hecta* ab. / *inversa* / ByS / Holotypus f // ab. *inversa* / ByS // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61345”.

Original locality. St. Amata, Lettonia [Latvia].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Bytinski-Salz (1939) proposed this name as an aberration of a *H. hecta*, therefore it is deemed to be infrasubspecific, which is hence unavailable (Article 45.6.2, ICZN 1999). The original locality is Latvia, not Britain as mentioned in Nielsen et al. (2000).

2. *Phymatopus hecta* ab. *confluens* (Bytinski-Salz, 1939)

Hepialus hecta ab. *confluens* Bytinski-Salz, 1939: Ent. Rec. 51: 84.

Original material examined. Labelled as “Holotype” (ZMH 61346), 1♂. Thundersley (Essex, Britain), 06.vii.1911, leg. A.T. Stiff. (Fig. 2). “*Hepialus* / *hecta* / ab. *confluens* / ByS / Holotypus m // A.T. Stiff, / Thundersley, SX. / July 6. 1911. // ab. *confluens* / ByS. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61346”.

Original locality. Thundersley [Essex, Britain].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Bytinski-Salz (1939) proposed this name as an aberration of a *H. hecta*, therefore it is deemed to be infrasubspecific, which is hence unavailable (Article 45.6.2, ICZN 1999).

3. *Pharmacis fusconebulosus* ab. *latefasciatus* (Bytinski-Salz, 1939)

Hepialus fusconebulosus ab. *latefasciatus* Bytinski-Salz, 1939: Ent. Rec. 51: 83.

Original material examined. Labelled as “Holotype” (ZMH 61347), 1♀ (Fig. 3). “*Hepialus* / *fuscnebulosus* / ab. *latefasciatus* / ByS / Holotypus f // ab. *latefasciatus* / ByS. // Pitcaple. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61347”.

Original locality. Pitcaple [Scotland].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Bytinski-Salz (1939) proposed this name as an aberration of a *H. hecta*, therefore it is deemed to be infrasubspecific, which is hence unavailable (Article 45.6.2, ICZN 1999).

4. *Pharmacis fusconebulosus* ab. *ornatus* (Bytinski-Salz, 1939)

Hepialus fusconebulosus ab. *ornatus* Bytinski-Salz, 1939: Ent. Rec. 51: 83.

Original material examined. Labelled as “Holotype” (ZMH 61348), 1♂, leg. A.J. Hodges (Fig. 4). “ab. *ornatus* / ByS // A.J.Hodges / Stiga- // *Hepialus* / *fuscnebul.* / ab. *ornatus* ByS // Holotypus m // ZMH 61348”.

Original locality. Sligo [Ireland].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Bytinski-Salz (1939) proposed this name as an aberration of a *H. fusconebulosus*, therefore it is deemed to be infrasubspecific, which is hence unavailable (Article 45.6.2, ICZN 1999).

5. *Hepialus humuli* ab. *roseoornata* (Bytinski-Salz, 1939)

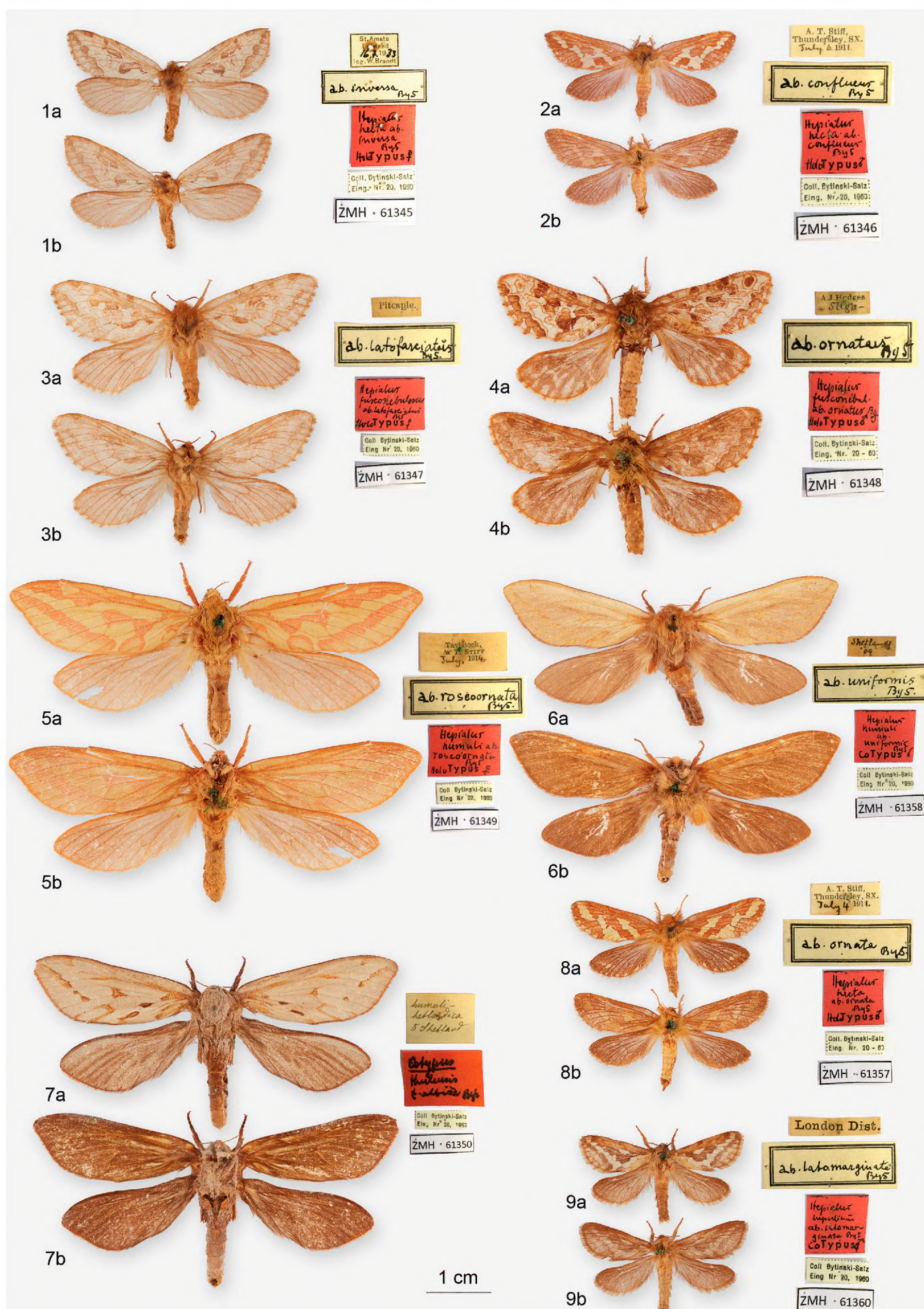
Hepialus humuli ab. *roseoornata* Bytinski-Salz, 1939: Ent. Rec. 51: 81.

Original material examined. Labelled as “Holotype” (ZMH 61349), 1♀, xii.1914, leg. A.T. Stiff (Fig. 5). “Tavistock / A.T. Stiff / July 1914 // ab. *roseoornata* / ByS. // *Hepialus* / *humuli* ab. / *roseoornata* / ByS / Holotypus f // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61349”.

Original locality. Tavistock [Britain].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Bytinski-Salz (1939) proposed this name as an aberration of *H. humuli*, therefore it is deemed to be infrasubspecific, which is hence unavailable (Article 45.6.2, ICZN 1999).



Figures 1–9. 1. *Phymatopus hecta* ab. *inversa* (Bytinski-Salz, 1939); 2. *Phymatopus hecta* ab. *confluens* (Bytinski-Salz, 1939); 3. *Pharmacis fusconebulosus* ab. *latefasciatus* (Bytinski-Salz, 1939); 4. *Pharmacis fusconebulosus* ab. *ornatus* (Bytinski-Salz, 1939); 5. *Hepialus humuli* ab. *roseornata* (Bytinski-Salz, 1939); 6. *Hepialus humuli* thulensis f. *uniformis* (Bytinski-Salz, 1939); 7. *Hepialus humuli* thulensis f. *albida* (Bytinski-Salz, 1939); 8. *Phymatopus hecta* ab. *ornata* (Bytinski-Salz, 1939); 9. *Korscheltellus lupulina* ab. *latemarginatus* (Bytinski-Salz, 1939).

6. *Hepialus humuli thulensis* f. *uniformis* (Bytinski-Salz, 1939)

Hepialus humuli thulensis f. *uniformis* Bytinski-Salz, 1939: Ent. Rec. 51: 82.

Original material examined. Labelled as “Cotype” (ZMH 61358 – 61359), 2♂♂, Shetland Isl., leg. 1909 (Fig. 7). Shetlands / 09 // ab. *uniformis* / Bys // *Hepialus / humuli* / ab. *uniformis* / Bys / CoTypus m // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61358”; “Shetlands / 09 // *Hepialus / humuli* / ab. *uniformis* / Bys / Cotypus m // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61359”.

Original locality. Shetland [Britain].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Bytinski-Salz (1939) proposed this name as a form of a subspecies. According to Article 45.6.4., the author expressly gave it infrasubspecific rank, in which case it is infrasubspecific, and hence unavailable.

7. *Hepialus humuli thulensis* f. *albida* (Bytinski-Salz, 1939)

Hepialus humuli thulensis f. *albida* Bytinski-Salz, 1939: Ent. Rec. 51: 82.

Original material examined. Labelled as “Cotype” (ZMH 61350 – 61356), 7♂♂, leg. A.J. Hodges, vii.1899, Shetland, 1909 (Fig. 6). “*humuli* – / *hetlandica* / 5 Shetland // Cotypus *thulensis* / t. *albida* Bys. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61350”; “Shetlands / 09 // Cotypus / *thulensis* / f. *albida* ByS. // Coll. Bytinski-Salz / Eing. Nr. 20 – 60 // ZMH 61351”; “Shetlands / 09 // Cotypus / *thulensis* / f. *albida* ByS. // ZMH 61352”; “Shetlands / 09 // Cotypus / *thulensis* / f. *albida* ByS. // Coll. Bytinski-Salz / Eing. Nr. 20–60 // ZMH 61353”; “A.J.Hodges / N.UNST / Y.99. N.B // Cotypus / *thulensis* / f. *albida* ByS. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61354”; “A.J.Hodges / Y. 99 Unst / Shitlands // Cotypus / *thulensis* / f. *albida* Bys. // Coll. Bytinski-Salz / Eing. Nr. 20–60 // ZMH 61355”; “A.J.Hodges / N.UNST / Y.99. N.B // f. *albida* / Bys. // Cotypus / *thulensis* / f. *albida* ByS. // Coll. Bytinski-Salz / Eing. Nr. 20–60 // ZMH 61356”.

Original locality. Shetland [Britain].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Bytinski-Salz (1939) proposed this name as a form of a subspecies. According to Article 45.6.4., the author expressly gave it infrasubspecific rank, in which case it is infrasubspecific, and hence unavailable.

8. *Phymatopus hecta* ab. *ornata* (Bytinski-Salz, 1939)

Hepialus hecta ab. *ornata* Bytinski-Salz, 1939: Ent. Rec. 51: 85.

Original material examined. Labelled as “Holotype” (ZMH 61357), 1♂ (Fig. 8). Thundersley, SX (Essex, Britain), 04.vii.1911, leg. A.T. Stiff. “*Hepialus / hecta* / ab.

ornata / ByS / Holotypus m // A.T. Stiff, / Thundersley, SX. / July 4 1911. // Coll. Bytinski-Salz / Eing. Nr. 20–60 // ab. *ornata* / ByS. // ZMH 61357”.

Original locality. Thundersley [Essex, Britain].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Bytinski-Salz (1939) proposed this name as an aberration of a *H. hecta*, therefore it is deemed to be infrasubspecific, which is hence unavailable (Article 45.6.2, ICZN 1999).

9. *Korscheltellus lupulina* ab. *latemarginatus* (Bytinski-Salz, 1939)

Hepialus lupulinus ab. *latemarginatus* Bytinski-Salz, 1939: Ent. Rec. 51: 84.

Original material examined. Labelled as “Cotype” (ZMH 61360–60361), 2♂♂. London Dist. And Wicken, leg. A.J. Hodges (Fig. 9). “London Dist. // ab. *latemarginatus* / ByS // ZMH 61360 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // *Hepialus / lupulina* / ab. *latemarginatus* ByS / Cotypus m”; “A.J.Hodges / Wicken // *Hepialus / lupulina* / ab. *latemarginatus* / ByS / Cotypus m // Coll. Bytinski-Salz / Eing. Nr. 20–60 // ZMH 61361”.

Original localities. London district and Wicken [Britain].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Bytinski-Salz (1939) proposed this name as an aberration of a *H. lupulinus*, therefore it is deemed to be infrasubspecific, which is hence unavailable (Article 45.6.2, ICZN 1999).

Superfamily Cossoidea Leach, 1815

The superfamily Cossoidea currently contains seven families (i.e., Brachodidae, Cossidae, Dudgeoneidae, Metarbelidae, Ratardidae, Castniidae, and Sesiidae) (van Nieukerken et al. 2011) with type representatives from the families Cossidae, Brachodidae, Metarbelidae, and Sesiidae in ZMH collection. They are generally concealed feeders and have spiny pupae with moveable segments to allow them to extrude out of their exit holes in stems and trunks during emergence of the adult (Edwards et al. 1999). The clearwing moths (Sesiidae) represent the largest radiation within the superfamily with about 1,400 valid species distributed in 154 genera (van Nieukerken et al. 2011). The carpenter moths (Cossidae) is the second largest group with about 1000 described species in 151 genera (Yakovlev 2011). The family Metarbelidae with more than 240 described species in 32 genera have their highest diversity in the Afrotropics (Lehmann 2019; Yakovlev and Zolotuhin 2020). However, the family is among the least known of Lepidoptera due their extreme rarity and rather cryptic appearance (Lehmann 2019).

Family Cossidae Leach, 1815

10. *Dyspessa hethitica* Daniel, 1932

Dyspessa hethitica Daniel, 1932: Mitt. Münch. Ent. Ges 22: 16.

Type material examined. Syntype (ZMH 61343), 1♂ (Fig. 10). “CO-TYPE VON / *DYSP/ HETHITICA* DAN / F. DANIEL / MÜNCHEN // TAURUS / MARASCH / 6-900M a.-m.VII.31. / EINH SAMMLER LEG / F.DANIEL / MÜNCHEN // *hethitica* / Dan. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61343”.

Type locality. Taurus, Marasch [Turkey]

Current status. Valid species.

Remarks. Based on Daniel’s study (Daniel 1932), he labelled all specimens (1♂ and 5♀) of the type series as cotypes; therefore all specimens are syntypes. Holotype (by original designation) in Museum Witt München, MWM (Yakovlev 2011). ZMH used to hold two syntypes of *D. hethitica* (Weidner 1974); however, the female specimen could not be located any more.

11. *Paropta frater* (Warnecke, 1929)

Cossus frater Warnecke, 1929: Int Ent Z 23: 389.

Type material examined. Paratlectotype (ZMH 61344), 1♂ Südwest Arabien, Yemen, Sanäa, 2.viii.1931 (Fig. 11). “Paratypoid / SüdWest-Arabien / Yemen Samaa- / ? .Rathjens 2.8.31 // *Cossus frater* Warn. // Sig.G Warnecke / Eing Nr 5 1949 // ZMH 61344”.

Type locality. Arabien, Yemen, Sanäa.

Current status. Valid species.

Remarks. It was assumed that the syntypes were destroyed during the Allied bombing of Hamburg during World War II. However, as Warnecke reported to Daniel, two syntypes at the ZMH were lost in 1943, but one of them had been stored in Saxony and thus survived the bombings (Weidner 1974). Other type material (syntypes) is in the British Museum of Natural History (Yakovlev 2011; Yakovlev and Witt 2017).

Family Brachodidae Agenjo, 1966

12. *Brachodes staudingeri* Kallies, 1998

Brachodes staudingeri Kallies, 1998: Nota Lepidopterol. 21: 178.

Type material examined. Paratype (ZMH 61342), 1♂ (Fig. 12). “Asia centr. Kirgisias / 42°05,30N 75°06,96E / area W of Issyk Kul / Kys-Art Pass 2600m / 15. VII.1994 / Leg. A. Kallies // PARATYPUS / *Brachodes / staudingeri* sp. nov. / KALLIES, des. 1998 // ZMH 61342”.

Type locality. West of Issyk Kul Kys-Art Pass, Kirgizstan.

Current status. Valid species.

Remarks. Holotypus ♂, Kirgizstan, 42°05,30'N, 75°06,96'E, W of Issyk Kul, Kys-Art Pass, 2600 m,

15.vii.1994, leg. Kallies, Špatenka & Petersen (MfN – Museum für Naturkunde. Zentralinstitut der Humboldt-Universität. Berlin. Deutschland) (Kallies 1998).

Family Sesiidae Boisduval, 1828

13. *Pyropteron chrysidiforme siculum f. fervens* Bytinski-Salz, 1937

Pyropteron chrysidiforme siculum f. fervens Bytinski-Salz 1937: Mem. Soc. Ent. Ital. 15 (1936): 198.

Original material examined. Labelled as “Holotype” (ZMH 61326), 1♀ (Fig. 13); Labelled as “Paratype” 1♀ (ZMH 61327). “Oristano / Sardinia / 11/12.6.35. / Dr. H. Bytinski-Salz // *chrysidiforme* / *fervens* / ByS / f TYPE / ex coll. / Dr. H. Bytinski-Salz // Coll Bytinski-Salz / Eing Nr 20–60 // *Pyropteron / chrysidiforme* Esp. / f. ind. *fervens* / f Holotype / F. Le Cerf det. 1936 // ZMH 61326”; “*chrysidiforme* ab. / *fervens* / ByS / m PARATYPE / ex coll. / Dr. H. Bytinski-Salz // *Pyr. chrysidiforme* / *fervens* / m (subtypique) / F. Le Cerf det. 1936 // Oristano / Sardinia / 11/12.6.35. / Dr. H. Bytinski-Salz // Coll Bytinski-Salz / Eing Nr 20, 1960 // ZMH 61327”.

Original locality. Sardinien, Oristano [Italy].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Bytinski-Salz (1937) proposed this name as a form of a *Pyropteron chrysidiforme siculum*. According to Article 45.6.4., the author expressly gave it infrasubspecific rank, in which case it is infrasubspecific, and hence unavailable.

14. *Similipepsis osuni* Bakowski & Kallies, 2008

Similipepsis osuni Bakowski & Kallies, 2008: Ann. Zool. 58 (4): 792.

Type material examined. Holotype (ZMH 61328), 1♂, W-Afrika, Nigeria, Ile-Ife, 13.v.1993 Ph. leg. L. Schlimm (Fig. 14). “Holotypus / *Similipepsis / osuni* / Bakowski & / Kallies 2008 // collection Riefenstahl / W-Afrika / Nigeria / Ile-Ife / 13.V.1993 Ph. / leg. L. Schlimm // ZMH 61328”.

Type locality. Ile-Ife, Osun State, Nigeria.

Current status. Valid species.

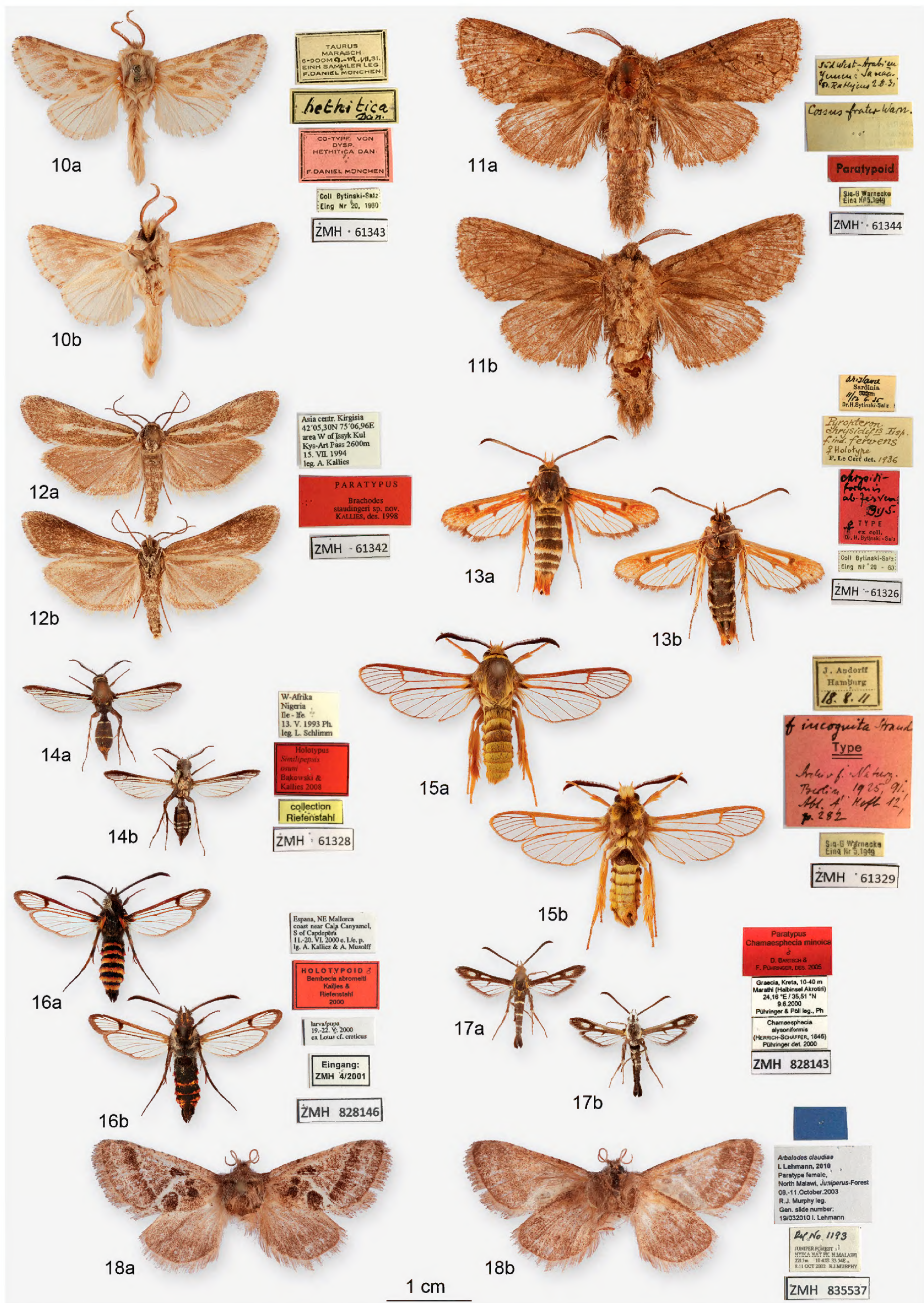
15. *Sesia bembeciformis* ab. *incognita* Strand, 1927

Sesia bembeciformis ab. *incognita* Strand, 1927: Arch. Naturg. 91 A (12): 282.

Original material examined. Labelled as “Holotype” (ZMH 61329), 1♂, J. Andorff, Hamburg, 18.viii.1911 (Fig. 15). „ZMH 61329 // Sig. G. Warnecke / Eing Nr 5. 1949 // J. Andorff / Hamburg / 18.8.11 // f. *incognita* Straude / Type / ? / Berlin, 1925, 9/ 12. / Abt.A / ? / 282”.

Original locality. Hamburg [Germany].

Current status. Infrasubspecific and hence unavailable name.



Figures 10–18. 10. *Dyspessa hethitica* Daniel, 1932; 11. *Paropta frater* (Warnecke, 1929); 12. *Brachodes staudingeri* Kallies, 1998; 13. *Pyropteron chrysidiforme siculum* f. *fervens* Bytinski-Salz, 1937; 14. *Similipepsis osuni* Bakowski & Kallies, 2008; 15. *Sesia bembeciformis* ab. *incognita* Strand, 1927; 16. *Bembecia abromeiti* Kallies & Riefenstahl, 2000; 17. *Chamaesphecia* (*Scopulosphecia*) *minoica* Bartssch & Pühringer, 2005; 18. *Arbelodes claudiae* Lehmann, 2010.

Remarks. Strand (1927) proposed this name as an aberration of *Sesia bembeciformis*, therefore it is deemed to be infrasubspecific, which is hence unavailable (Article 45.6.2, ICZN 1999).

16. *Bembecia abromeiti* Kallies & Riefenstahl, 2000

Bembecia abromeiti Kallies & Riefenstahl 2000: Ent. Zs. 110 (12): 359.

Type material examined. Holotype (ZMH 828146), 1♂ (Fig. 16). “Holotypoid m / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // Eingang: / ZMH 4/2001 // larva / pupa / 19.–22.V.2000 / ex Lotus cf. creticus // Espana, NE Mallorca / coast near Cala Canyamel, / S of Capdepera / 11.–20. VI. 2000 e.l. / e.p. / lg. A. Kallies & A. Musolff // ZMH 828146“. Paratypes 18♂♀ (ZMH 61330–ZMH 61341, ZMH 828144–ZMH 828145, ZMH 828215–ZMH 828216, ZMH 833440–ZMH 833441) „PARATYPOID m / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // SPANIEN / MALLORCA / San Pedro / 39/44/50–03/17/52 // 20.–30.5.2000 / leg. Riefenstahl/Roloff // ZMH 61330“; „SPANIEN / MALLORCA / San Pedro / 39/44/50–03/17/52 // 20.–30.5.2000 / leg. Riefenstahl/Roloff // PARATYPOID m / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // ZMH 61331“; „SPANIEN / MALLORCA / Calas de Mallorca / 39/28/02–03/16/14 // 20.–30.5.2000 / leg. Riefenstahl / Roloff // PARATYPOID m / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // ZMH 61332“; „SPANIEN / MALLORCA / Cala Agulla / 39/43/15–03/27/21 // 20.–30.5.2000 / leg. Riefenstahl / Roloff // PARATYPOID m / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // ZMH 61333“; „SPANIEN / MALLORCA / Cala Agulla / 39/43/15–03/27/21 // 20.–30.5.2000 / leg. Riefenstahl / Roloff // PARATYPOID m / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // ZMH 61334“; „SPANIEN / MALLORCA / San Pedro / 39/44/50–03/17/52 // 20.–30.5.2000 / leg. Riefenstahl/Roloff // PARATYPOID m / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // ZMH 61335“; „SPANIEN / MALLORCA / Cala Ratjada / 39/41/23–03/27/16 // leg. Riefenstahl / Roloff // PARATYPOID m / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // ZMH 61336“; „SPANIEN/MALLORCA / Cala Ratjada / 39/41/23–03/27/16 // e.p. 2.–15.6.2000 / leg. Riefenstahl / Roloff // PARATYPOID f / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // ZMH 61337“; „SPANIEN / MALLORCA / Cala Torta / 39/45/05–03/24/49 // 20.–30.5.2000 / leg. Riefenstahl / Roloff // PARATYPOID f / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // ZMH 61338“; „SPANIEN / MALLORCA / Cala Agulla / 39/43/15–03/27/21 // 20.–30.5.2000 / leg. Riefenstahl / Roloff // PARATYPOID m / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // ZMH 61339“; „SPANIEN / MALLORCA / Cala Ratjada / 39/41/23–03/27/16 // leg. Riefenstahl / Roloff // PARATYPOID f / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // ZMH 61340“; „SPANIEN / MALLORCA / Cala Ratjada / 39/41/23–03/27/16 // leg. Riefenstahl / Roloff // PARATYPOID m

/ *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // ZMH 61341“; „SPANIEN / MALLORCA / Cala Agulla / 39/43/15–03/27/21 // 20.–30.5.2000 / leg. Riefenstahl / Roloff // PARATYPOID m / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // Eingang: / ZMH 4/2001 // ZMH 828144“; „Paratypoid m / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // SPANIEN / MALLORCA / Cala Agulla / 39/43/15–03/27/21 // 20.–30.5.2000 / leg. Riefenstahl / Roloff // Eingang: / ZMH 4/2001 // ZMH 828145“; „Eing.-Nr. / ZMUH 1/2013 // Paratypoid m / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // SPANIEN / MALLORCA / Cala Ratjada / 39/44/50–03/17/52 // 20.–30.5.2000 / leg. Riefenstahl / Roloff // ZMH 828215“; „Eing.-Nr. / ZMUH 1/2013 // Paratypoid m / *Bembecia abromeiti* / Kallies & / Riefenstahl / 2000 // SPANIEN / MALLORCA / Cala Ratjada / 39/41/23–03/27/16 // 20.–30.5.2000 / leg. Riefenstahl / Roloff // ZMH 828216”

Type locality. Espana, NE Mallorca [Spain].

Current status. Valid species.

17. *Chamaesphecia (Scopulosphecia) minoica* Bartsch & Puehringer, 2005

Chamaesphecia minoica Bartsch & Pühringer, 2005: Ent. Z. 115(3), 135.

Type material examined. Paratype (ZMH 828143), 1♂ (Fig. 17). “Paratypus / *Chamaesphecia minoica* / m / D. BARTSCH & / F. PÜHRINGER, DES. 2005 // Graecia, Kreta, 10–40 m / Marathi (Halbinsel Akrotiri) / 24,16°E / 35,51°N / 9.6.2000 // Pühringer & Pöll leg., Ph // *Chamaesphecia / alysoniformis* / (HERRICH-SCHÄFFER, 1846) / Pühringer det. 2000 // ZMH 828143”.

Type locality. Kreta, Graecia (Greece).

Current status. Valid species.

Family Metarbelidae Strand, 1909

18. *Arbelodes claudiae* Lehmann, 2010

Arbelodes claudiae Lehmann, 2010: 27–31.

Type material examined. Paratype (ZMH 835537), 1♀ (Fig. 18). “*Arbelodes claudiae* / I. Lehmann, 2010 / Paratype female, / North Malawi, Juniperus-Forest / 08.–11. October.2003 / R. J. Murphy leg. / Gen. slide number: / 19/03/2010 I. Lehmann // Def No 1193 / JUNIPER FOREST / NYIKA NAT PK N MALAWI / 2215m 1045S 3354E / 8–11 OCT 2003 R. J. Murphy // ZMH 835537”.

Type locality. Mzuzu, Nkhorongo, 1375 m., North Malawi.

Current status. Valid species.

Superfamily Zygaenoidea Latreille, 1809

The definition of the superfamily Zygaenoidea is based on only few characters. Although these characters are

possibly autapomorphies this is partly not confirmed and is still a matter of discussion. The discussed characters are: head retractibility in larva, heteromorphosis, forward migration and reduction of head setae, position of microsetae and pores, labral sensilla (Vegliante and Zilli 2004). However, most of these characters have still not been sufficiently studied throughout all families. An overview regarding this discussion can be found in Efetov and Tarmann (2017). The Zygaenoidea contain the 13 families: Epipyropidae, Cyclotornidae, Himantopteridae, Anomoeotidae, Megalopygidae, Somabrachidae, Aididae, Limacodidae, Dalceridae, Lacturidae, Heterogynidae, Phaudidae, and Zygaenidae (Epstein et al. 1999; Efetov et al. 2014).

The family Zygaenidae has a world-wide distribution and is divided into the five subfamilies Inouelinae, Procridinae, Chalcosiinae, Callizygaeninae and Zygaeninae (Efetov and Tarmann 2017); it includes more than 1,000 species. 25 relevant characters that are possibly part of a ‘hypothetical groundplan’ of the family are discussed in detail in Efetov and Tarmann (2017). The most relevant possible autapomorphies of Zygaenidae are: 1. Cyanogenesis and resistance against cyanides. 2. Head with ocelli and chaetosemata present (as in some other more primitive ditrysian groups, e.g. Yponomeutoidea and Tortricoidea). This character combination is absent in all other Zygaenoidea. 3. Development of Petersen’s gland (a pair of glands close to the ooporus in Zygaeninae and Procridinae of not exactly known function). This character is considered to be secondarily reduced in Inouelinae, Chalcosiinae and Callizygaeninae. This gland seems to have an importance for the protection of the eggs against predators.

Family Zygaenidae Latreille, 1809

Subfamily Zygaeninae Latreille, 1809

19. *Zygaena (Agrumenia) carniolica berolinensis* v. *pinskica* Reiss, 1941

Zygaena (Agrumenia) carniolica Scop. subsp. *berolinensis* Stgr. var. *pinskica* n. var. (subsp. ?): Z. Wien. Ent. Ver. 26: 59.

Original material examined. Labelled as “Cotype” 5♂♀ (ZMH 61362–61365, 61367) (Fig. 19). “Piokitao / Sümpfe / 18.7.17. // // Cotype f / *pinskica* / Reiß 1941. / H.Reiss // ZMH 61362”; “Rokituo / Sümpfe / 17.7.17. // // Cotype m / *pinskica* / Reiß 1941. / H.Reiss // ZMH 61363”; “Rokituo / Sümpfe / 18.7.17. // // Cotype m / *pinskica* / Reiß 1941. / H.Reiss // ZMH 61364”; “Rokituo / Sümpfe / 17.7.17. // // Cotype f / *pinskica* / Reiß 1941. / H.Reiss // ZMH 61365”; “Rofrituo / Sümpfe / 12.7.17. // // Cotype m / *pinskica* / Reiß 1941. / H.Reiss // ZMH 61367”.

Original locality. ‘Pinsk, Lesnaja (Rokitno)’ [Belarus: Pinsk, Ljesnaja (Roknito)] (Hofmann and Tremewan 1996: 112).

Current status. Intrasubspecific and hence unavailable name.

Remarks. Reiss (1941) proposed this name as a local variant of *Z. c. berolinensis* Lederer, 1853 with the remark ‘var. *pinskica* n. var. (subsp.?)’. According to Article 45.6.4., the author expressly gave it infrasubspecific rank, in which case it is infrasubspecific, and hence unavailable.

20. *Zygaena (Agrumenia) carniolica pinskica* ab. *cingulata* Reiss, 1941

Zygaena (Agrumenia) carniolica pinskica ab. *cingulata* Reiss, 1941: Z. Wien. Ent. Ver. 26: 59.

Original material examined. Labelled as “Type” 1♂ (ZMH 61366) (Fig. 20). “Rokinto / Sümpfe / 10.7.17. // // Type // ab. *cingulata* Reiss // Type m / 1941 / *pinskica* / Reiß ab. / *cingulata* / Reiß H. Reiss // ZMH 61366”.

Original locality. ‘Pinsk, Lesnaja (Rokitno)’ [Belarus: Pinsk, Ljesnaja (Roknito)] (Hofmann and Tremewan 1996: 112).

Current status. Intrasubspecific and hence unavailable name.

Remarks. Reiss (1941) proposed this name as an aberration of *Z. c. pinskica* Reiss, 1941. Therefore, as stated by Articles 45.6.1 and 45.6.2 (ICZN 1999) it is deemed to be infrasubspecific name – if author used “aberration”, “ab.”, “morph”, or the author expressly gave it infrasubspecific rank – which is hence unavailable.

21. *Zygaena (Zygaena) angelicae ternovanensis* Koch, 1938

Zygaena (Zygaena) angelicae ternovanensis Koch, 1938: Z. Öst. Ent. Ver. 23: 17–18.

Type material examined. Syntypes 3♂♂ (ZMH 61368–61370) (Fig. 21). “? / 7.1932 // v. *ternovanensis* / Koch // Cotypus // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61368”; “? / e.l. 6.1927. / P. Ronnicke // Cotypus // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61369”; “Tamooamer / Wald // Cotypus // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61370”.

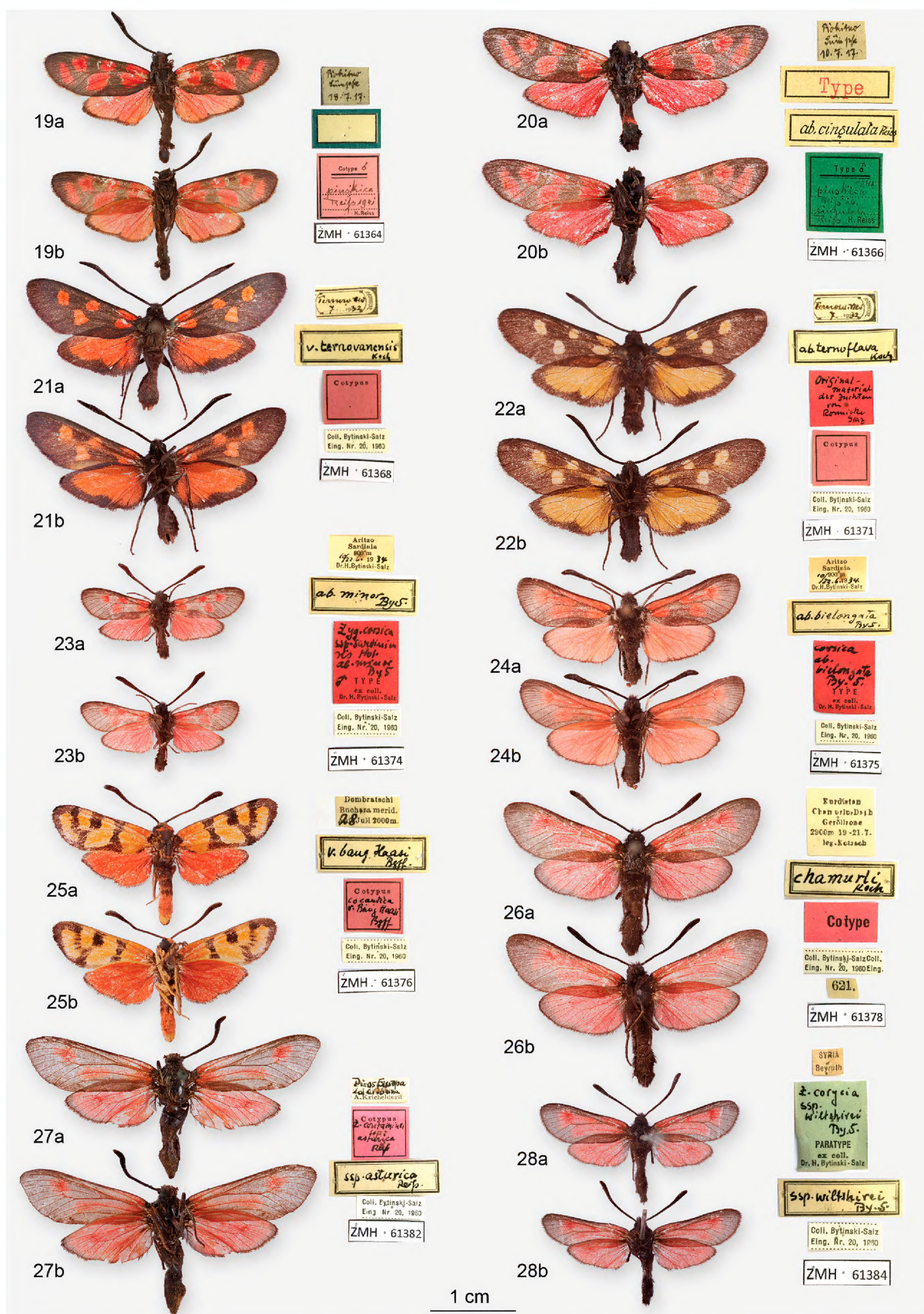
Type localities. Slovenia [Julisches Venetien]: Nova Gorizia [Görz], Trnovski Gozd [Ternovaner-Wald] (Hofmann and Tremewan 1996)

Current status. Valid subspecies

22. *Zygaena (Zygaena) angelicae ternovanensis* ab. *ternoflava* Koch, 1938

Zygaena (Zygaena) angelicae ternovanensis ab. *ternoflava* Koch, 1938: Z. Öst. Ent. Ver. 23: 17–18.

Original material examined. Labelled as “Cotype” 2♂♂ (ZMH 61371–ZMH 61372) (Fig. 22). „*Ternov. nes* / 7.1932 // Cotypus // Original- / material / der Zuchten / von / Ronnicker / Graz // ab. *ternoflava* / Koch // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61371“; „? /



Figures 19–28. 19. *Zygaena (Agrumenia) carniolica* v. *pinskica* Reiss, 1941; 20. *Zygaena (Agrumenia) carniolica* *pinskica* ab. *cingulata* Reiss, 1941; 21. *Zygaena (Zygaena) angelicae* *ternovanensis* Koch, 1938; 22. *Zygaena (Zygaena) angelicae* *ternovanensis* ab. *ternoflava* Koch, 1938; 23. *Zygaena (Mesembrynus) corsica* *sardiniensis* ab. *minor* Bytinski-Salz, 1937; 24. *Zygaena (Mesembrynus) corsica* *sardiniensis* ab. *bielongata* Bytinski-Salz, 1937; 25. *Zygaena (Agrumenia) cocandica* *banghaasi* Burgeff, 1927; 26. *Zygaena (Mesembrynus) purpuralis* *chamurli* Koch, 1935; 27. *Zygaena (Mesembrynus) contaminei* *asturica* Reiss, 1936; 28. *Zygaena (Mesembrynus) corycia* r. *wiltshirei* Bytinski-Salz, 1936.

7.1932 // Cotypus / Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61372“

Original locality. ‘Jugoslawien, Julisches Venetien, Ternovaner Wald, nordöstlich von Görz, 800–900 m.’ [Slovenia: Nova Gorizia, Trnovski Gozd]

Current status. Intrasubspecific and hence unavailable name.

Remarks. Koch (1938) proposed this name as an aberration of *Z. c. ternovanensis* Koch, 1938, therefore as stated by Articles 45.6.1 and 45.6.2 (ICZN 1999) it is deemed to be infrasubspecific name – if author used “aberration”, “ab.”, “morph”, or the author expressly gave it infrasubspecific rank – which is hence unavailable.

23. *Zygaena (Mesembrynus) corsica sardiniensis* ab. *minor* Bytinski-Salz, 1937

Zygaena corsica sardiniensis ab. *minor* Bytinski-Salz, 1937: Mem. Soc. Ent. Ital. 15 (1936): 196.

Original material examined. Labelled as “Type” 1♂ (ZHM 61374) (Fig. 23). “Aritzo / Sardinia / 900 m / 10/22.6.1934 / Dr. H. Bytinski-Salz // *Zyg. corsica* / wp-Sardinia / ? / ab. minor / ByS / m TYPE / ex.coll. / Dr. H. Bytinski-Salz // ab. minor / By.S. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61374”.

Original locality. Aritzo, Sardinia [Italy].

Current status. Intrasubspecific and hence unavailable name.

Remarks. Bytinski-Salz (1937) proposed this name as an aberration of *Z. c. sardiniensis* Holik, 1936, therefore as stated by Articles 45.6.1 and 45.6.2 (ICZN 1999) it is deemed to be infrasubspecific name – if author used “aberration”, “ab.”, “morph”, or the author expressly gave it infrasubspecific rank – which is hence unavailable.

24. *Zygaena (Mesembrynus) corsica sardiniensis* ab. *bielongata* Bytinski-Salz, 1937

Zygaena corsica sardiniensis ab. *bielongata* Bytinski-Salz, 1937: Mem. Soc. Ent. Ital. 15 (1936): 196.

Original material examined. Labelled as “Type” 1♂ (ZHM 61375) (Fig. 24). “Aritzo / Sardinia / 900 m / 10/22.6.1934 / Dr. H. Bytinski-Salz // *corsica* / ab. / belongata / Bys. / TYPE / ex. coll. / Dr. H. Bytinski-Salz // ab. belongata / ByS. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61375”.

Original locality. Aritzo, Sardinia [Italy].

Current status. Intrasubspecific and hence unavailable name.

Remarks. Bytinski-Salz (1937) proposed this name as an aberration of *Z. c. sardiniensis* Holik, 1936. Therefore, as stated by Articles 45.6.1 and 45.6.2 (ICZN 1999) it is deemed to be infrasubspecific name – if author used “aberration”, “ab.”, “morph”, or the author expressly gave it infrasubspecific rank – which is hence unavailable.

25. *Zygaena (Agrumenia) cocandica banghaasi* Burgeff, 1927

Zygaena (Agrumenia) cocandica banghaasi Burgeff, 1927: Horae Macrolep. Reg. Pal. 1: xxvii: 56.

Type material examined. Syntypes 2♂♂ (ZHM 61376–ZMH 61377) (Fig. 25). “Dombratschi / Bucharmerid. / 28.Juli 2000m. // Cotypus / *cocandica* / v. *BangHaasi* / Bgff. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // v. *banghaasi* / Bgff. // ZMH 61376 “; “Dombratschi / Bucharmerid. / 28.Juli 2000m. // Cotypus / *cocandica* / v. *BangHaasi* / Bgff. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61377”.

Type locality. ‘Bucharmerid. Karategin mont. mer. or.’ [Tajikistan: Karategin Range].

Current status. Synonym of *Zygaena (Agrumenia) cocandica cocandica* Erschoff, 1874.

Remarks. Burgeff (1927) proposed this name as subspecies of *Z. cocandica*, but this taxon was synonymized with *Zygaena (Agrumenia) cocandica cocandica* Erschoff, 1874 (Hofmann and Tremewan 1996).

26. *Zygaena (Mesembrynus) purpuralis chamurli* Koch, 1935

Zygaena purpuralis ssp. *chamurli* Koch, 1935 (1934): Dt. Ent. Z. Iris 48 (1934): 192.

Type material examined. Paralectotypes 4♂♂. (ZHM 61378–ZMH 61381) (Fig. 26). «Kurdistan / Chanur-Dagh / Geröllzone / 2900m 19–21.7. / leg. Kotzsch // *chamurli* / Koch // Cotype // 621. // Coll. Bytinski-Salz Coll. / Eing. Nr. 20, 1960 Eing. // ZMH 61378»; «Kurdistan / Chanur-Dagh / Geröllzone / 2900m 19–21.7. / leg. Kotzsch // Cotype // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // 618. // ZMH 61379”; «Kurdistan / Chanur-Dagh / Geröllzone / 2900m 19–21.7. / leg. Kotzsch // Cotype // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // 619. // ZMH 61380”; «Kurdistan / Chanur-Dagh / Geröllzone / 2900m 19–21.7. / leg. Kotzsch // Cotype // 620. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61381”.

Type locality. ‘Kurdistan. Chamurlu-Dagh, bei Sarikamisch, 70 km südwestlich von Kars, Geröllhalden, 2900 m, 19–21.xii.1934’ [NE Turkey: Kars, Sarikamisch, Çamurlu Dağı].

Current status. Valid subspecies. Under revision.

Remarks. Based on the revision of Naumann (1982), he designated lectotype from an original specimen described by Koch from the collection of “Staatl. Museum für Tierkunde Dresden”. Therefore, the rest of the type specimens are paralectotypes. The taxon group containing *Zygaena purpuralis chamurli* Koch, 1935 is currently revised by Ana Nahirnić (National Museum of Natural History, Bulgaria, Sofia).

27. *Zygaena (Mesembrynus) contaminei asturica* Reiss, 1936

Zygaena (Mesembrynus) contaminei asturica Reiss, 1936: Entomologische Rundschau 54: 59.

Type material examined. Syntypes 2♂♂ (ZHM 61382–ZMH 61383) (Fig. 27). “Picos Europa / da Liebana / A. Kricheldorf // Cotypus / *Z. contaminei* / ssp. / *asturica* / Reiß // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ssp. *asturica* / Reiß // ZMH 61382”; “Picos Europa / da Liebana / A. Kricheldorf // Cotypus / *Z. contaminei* / ssp. / *asturica* / Reiß // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61383”.

Type locality. ‘La Liébana’ [Spain: Cantabria, La Vega de Liébana] (Hofmann and Tremewan 1996).

Current status. Synonym of *Zygaena contaminei penalabrica* Fernández, 1929.

Remarks. Synonym to *Zygaena contaminei penalabrica* Fernández, 1929 (Hofmann and Tremewan 1996).

28. *Zygaena (Mesembrynus) corycia* r. *wiltshirei* Bytinski-Salz, 1936

Zygaena corycia ‘race’ *wiltshirei* Bytinski-Salz, 1936: Ent. Rec. J. Var. 48 (Suppl.): (1)–(6): (1).

Original material examined. Labelled as “Paratype” 1♂ (ZHM 61384) (Fig. 28). “SYRIA // *Z. corycia* / ssp. / *wiltshirei* / By.S. / PARATYPE / ex coll. / Dr. H. Bytinski-Salz // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ssp. *wiltshirei* / By.S. // ZMH 61384”.

Original locality. ‘Kineseh’ [Lebanon: Djebel Kineseh].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Bytinski-Salz (1936) proposed this name as a ‘race’ of *Z. corycia* Staudinger, 1871. Therefore, as stated by Article 45.6.1 (“the content of the work unambiguously reveals that the name was proposed for an infrasubspecific entity”) it is deemed to be infrasubspecific name, which is hence unavailable. *Zygaena corycia* was downgraded to a subspecies of *Z. (Mesembrynus) brizae* (Esper, 1800) (Hofmann and Tremewan 1996).

29. *Zygaena (Mesembrynus) brizae staudingeriana* Reiss, 1932

Zygaena (Mesembrynus) corycia staudingeriana Reiss, 1932: Int. Ent. Z. 26: 270.

Type material examined. Syntypes 6♂♂ (ZHM 61385–ZMH 61390) (Fig. 29). “SYRIA / LIBANON / BSCHARRE / 1600M 1,–15 VI.31 / E. PFEIFFER LEG / F DANIEL / MÜNCHEN // CO-TYPE VON / *Z. CORYCIA* SSP. / *STAUDINGERIANA* / REISS / DANIEL / MÜNCHEN // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // v. *staudingerialis* / Reiß. // ZMH 61385”; “SYRIA / LIBANON / BSCHARRE / 1600M 1,–15 VI.31 / E. PFEIFFER LEG / F DANIEL / MÜNCHEN

// CO-TYPE VON / *Z. CORYCIA* SSP. / *STAUDINGERIANA* / REISS / DANIEL / MÜNCHEN // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61386”; “SYRIA / LIBANON / BSCHARRE / 1300M 1, –15 VI.31 / E. PFEIFFER LEG / F DANIEL / MÜNCHEN // CO-TYPE VON / *Z. CORYCIA* SSP. / *STAUDINGERIANA* / REISS / DANIEL / MÜNCHEN // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61387”; “Becharree / Libanon / Juni 31. / Kulzer. // CO-TYPE VON / *Z. CORYCIA* SPP. / *STAUDINGERIANA* / REISS / DANIEL / MÜNCHEN // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61388”; “Becharree / Libanon / Juni 31. / Kulzer // CO-TYPE VON / *Z. CORYCIA* SPP. / *STAUDINGERIANA* / REISS / DANIEL / MÜNCHEN // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61389”; “Becharree / Libanon / Juni 31. / Kulzer // CO-TYPE VON / *Z. CORYCIA* SPP. / *STAUDINGERIANA* / REISS / DANIEL / MÜNCHEN // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61390”.

Type locality. Libanon, Bscharre [Lebanon].

Current status. Valid subspecies.

Remarks. Reiss (1932a) proposed this name as a subspecies of *Z. corycia* Staudinger, 1871, but this species name was synonymized with *Z. (Mesembrynus) brizae* (Esper, 1800) (Hofmann and Tremewan 1996), thus the current combination is *Z. (M.) brizae staudingeriana* Reiss, 1932.

30. *Zygaena (Mesembrynus) corycia* r. *amseli* Bytinski-Salz, 1936

Zygaena corycia ‘race’ *amseli* Bytinski-Salz, 1936: Ent. Rec. J. Var. 48 (Suppl.): (1)–(6): 2.

Original material examined. Labelled as “Cotype” 4♂♂ (ZHM 61391–ZMH 61394) (Fig. 30). “Ain Karem / b. Jerusalem / 21.4.30 / leg. H. G. Amsel // Cotypus / *Corycia* / ssp. / *amseli* / By.S. // ssp. *amseli* / ByS. // *Corycia* / Stgr. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61391”; „Ain Karem / b. Jerusalem / 21.4.30 / leg. H. G. Amsel // Cotypus / *Corycia* / ssp. / *amseli* / ByS. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61392”; “Ain Karem / b. Jerusalem / 21.4.30 / leg. H. G. Amsel // Cotypus / *Corycia* / ssp. / *amseli* / ByS. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61393”; „Ain Karem / b. Jerusalem / 21.4.30 / leg. H. G. Amsel // Cotypus / *Corycia* / ssp. / *amseli* / ByS. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61394”.

Original locality. ‘Ain Karem, Palestine’ [Israel: Jerusalem West, En Kerem].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Bytinski-Salz (1936) proposed this name as ‘race’ (= subspecies) of *Z. corycia* Staudinger, 1871. Therefore, as stated by Article 45.6.1 (“the content of the work unambiguously reveals that the name was proposed for an infrasubspecific entity”) it is deemed to be infrasubspecific name, which is hence unavailable.



Figures 29–36. 29. *Zygaena (Mesembrynus) brizae staudingeriana* Reiss, 1932; 30. *Zygaena (Mesembrynus) corycia* r. *amseli* Bytinski-Salz, 1936; 31. *Zygaena (Zygaena) ephialtes* ab. *maureri* Dziurzynski, 1913; 32. *Zygaena (Zygaena) ephialtes* *kiewensis* Reiss, 1932; 33. *Zygaena (Zygaena) dorycnii* *korbiana* Reiss, 1935; 34. *Zygaena (Agrumenia) fausta* *agilis* Reiss, 1932; 35. *Zygaena (Agrumenia) exulans* *sajana* Burgeff, 1926; 36. *Zygaena (Agrumenia) exulans* *polaris* Holik, 1935.

31. *Zygaena (Zygaena) ephialtes* ab. *maureri* Dziurzynski, 1913

Zygaena ephialtes ab. *maureri* Dziurzynski 1913: Jber. Wien. Ent. Ver. 23 (1912): 215.

Original material examined. Labelled as “Type” 1♂ (ZMH 61395) (Fig. 31). „Weiz oder Wuz / 22/7 // ex coll. Ronnicke / TYPE // ab. maueri / DZ. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61395“.

Original locality. ‘Steiermark, Weiz (in der Raaberkamm)’ [Austria: Styria, Weiz, Rabenklamm].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Dziurzynski (1913) proposed this name as an aberration of *Z. ephialtes* (Linnaeus, 1767). Therefore, it is deemed to be infrasubspecific, it is hence unavailable (Article 45.6.2, ICZN 1999).

32. *Zygaena (Zygaena) ephialtes kiewensis* Reiss, 1932

Zygaena ephialtes kiewensis Reiss, 1932: Dt. Ent. Z. Iris 26: 130.

Type material examined. Syntype 1♂ (ZHM 61396) (Fig. 32). “? / 9.VII.30 // Kiev // Cotype m / *kiewensis* / Reiß 1932 / H. Reiss // *kiewensis* / Reiß // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61396”.

Type locality. ‘Ukraine: Kirillovskije ovragi’ [Ukraine: vicinity of Kiyev].

Current status. Synonym of *Z. ephialtes aethamantae* (Esper, 1789).

Remarks. Reiss (1932b) in Holik (1932) proposed this name as a subspecies of *Z. ephialtes* (Linnaeus, 1767). The name was subsequently synonymized with *Z. ephialtes aethamantae* (Esper, 1789) (Hofmann and Tremewan 1996).

33. *Zygaena (Zygaena) dorycnii korbiana* Reiss, 1935

Zygaena dorycnii korbiana Reiss, 1935: Int. Ent. Z. 29: 230

Type material examined. Syntype 1♂ (ZHM 61400) (Fig. 33). “Achalzich / (Chamoobel) / 1910 Korb // ssp. *korbiana* / Reiß // Cotypus / *dorycnii* / ssp. *korbi- / ana* / Reiss // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61400”.

Type locality. Transkaukasien, Akhaltsikhe [Georgia, Chamoobel].

Current status. Synonym of *Z. dorycnii dorycnii* Ochsenheimer, 1808.

Remarks. Reiss (1935c) proposed this name as subspecies of *Z. dorycnii* Ochsenheimer, 1808. The name was subsequently synonymized with the nominotypical *Z. dorycnii dorycnii* Ochsenheimer, 1808 (Hofmann and Tremewan 1996).

34. *Zygaena (Agrumenia) fausta agilis* Reiss, 1932

Zygaena fausta agilis Reiss, 1932: Int. Ent. Z. 29: 227.

Type material examined. Syntypes 2♂♂ (ZHM 61401–ZMH 61402) (Fig. 34). “*Zyg. fausta* / Jena 10.72 // Cotype m / *agilis* / Reiß / H. Reiss // ssp. *agilis* / Reiß // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61401”; “*Zyg. fausta* / Jena 10.72 // Cotype f / *agilis* / Reiß / H. Reiss // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61402”.

Type locality. Thüringen, Jena [Germany].

Current status. Valid subspecies.

Remarks. Reiss (1932c) proposed this name as subspecies of *Z. fausta* (Linnaeus, 1767) that is considered a valid subspecies name.

35. *Zygaena (Agrumenia) exulans sajana* Burgeff, 1926

Zygaena exulans sajana Burgeff, 1926: Mitteilungen der Münchner Entomologischen Gesellschaft 16: 25.

Type material examined. Paratypes 3♂♂ (ZHM 61403–ZMH 61405) (Fig. 35). “Munko Sardyk / Sajana mont. // Cotypus / *exulans* / ssp. *sajana* / Bgff // ssp. *sajana* / Bgff. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61403”; “Schawyr / Tannuola or. / Juni 2500 m // Cotypus / *exulans* / ssp. *sajana* / Bgff // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61404”; “Schawyr / Tannuola or. / Juni 2500m // Cotypus / *exulans* / ssp. *sajana* / Bgff // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61405”.

Type localities. ‘Sajangebirge (Munko Sardyk und Schawyr, Tannuola or.)’ [Munko-Sardyk mountain in Western Buryatia near Mongolian Border].

Current status. Valid subspecies.

Remarks. Burgeff (1926) proposed this name as a subspecies of *Z. exulans* (Hohenwarth, 1792) that is considered a valid subspecies name. As Burgeff’s holotypes are in the Eidgenössische Technische Hochschule (ETH), Zürich, in Switzerland, these cotypes must be paratypes.

36. *Zygaena (Agrumenia) exulans polaris* Holik, 1935

Zygaena exulans var. *polaris* Holik, 1935: Dalm. Ent Tisdkr 56, 47.

Type material examined. Syntypes 2♂♂ (ZHM 61406–ZMH 61407) (Fig. 36). «Rybatschi H.-Ins / Murman-Küste / Fjeldzone 300m. / 70° N.Br. 28.6.–8.7 / leg. Kotzsch // Cotypus / *Z. exulans* / ssp. *polaris* / Holik // ssp. *polaris* / Holik. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61406“; „Rybatschi H.-Ins / Murman-Küste / Fjeldzone 300 m. / 70° N. Br. 28.6.–8.7 / leg. Kotzsch // Cotypus / *Z. exulans* / ssp. *polaris* / Holik // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61407”.

Type locality. Rybatschiy H.-Ins, Murman-Küste, Fjeldzone, 150 m.

Current status. Synonym of *Z. exulans vanadis* Dalman, 1816.

Remarks. Holik (1935) proposed this name as a variation of *Z. exulans* (Hohenwarth, 1792) from Arctic

Russia (Murmansk area). According to Article 45.6.4., it is subspecific if first published before 1961 and author expressly used the terms “variety”. This ‘variation’ was a group of populations with a defined range and was therefore treated as a subspecies by Reiss and Tremewan (1967). Later, Hofmann and Tremewan (1996) synonymised it with *Z. exulans vanadis* Dalman, 1816. ‘variatio’, in 1935 this term was often used in the current sense of subspecies.

37. *Zygaena (Mesembrynus) graslini rebeli* Reiss, 1932

Zygaena graslini Lederer subsp. *rebeli* Reiss, 1932: Int. Ent. Z. 26: 275.

Type material examined. Syntypes 6♂♀ (ZMH 61412–ZMH 61417) (Fig. 37). “AMANUS S. / DÜL-DÜL DAGH / YÜKSEK DAGH / ANF.-M. IV 32. / EINH. SAMMLER LEG. / F DANIEL / MÜNCHEN // Cotypus // ssp. *rebeli* / Reiß. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61412“; „AMANUS S. / DUL-DUL DAGH / YUKSEK DAGH / ANF.-M. IV 32. / EINH SAMMLER LEG. / F. DANIEL / MÜNCHEN // Cotypus // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61413“; „AMANUS S. / DUL-DUL DAGH / YUKSEK DAGH / ANF.-M. IV 32. / EINH SAMMLER LEG. / F. DANIEL / MÜNCHEN // CO-TYPE VON / Z. GRASLINI / SSP. REBELI / REISS / DANIEL / MÜNCHEN // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61414“; „AMANUS S. / DUL-DUL DAGH / YUKSEK DAGH / ANF.-M. IV 32. / EINH SAMMLER LEG. / F. DANIEL / MÜNCHEN // Cotypus // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61415“; „AMANUS S. / DUL-DUL DAGH / YUKSEK DAGH / ANF.-M. IV 32. / EINH SAMMLER LEG. / F. DANIEL / MÜNCHEN // Cotypus // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61416“; „AMANUS S. / DUL-DUL DAGH / YUKSEK DAGH / ANF.-M. IV 32. / EINH SAMMLER LEG. / F. DANIEL / MÜNCHEN // Cotypus // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61417“.

Type locality. Yüksesk Dag, Amanus.

Current status. Invalid subspecies. There are currently no subspecies accepted in *Zygaena graslini*. Synonym of *Zygaena (Mesembrynus) graslini* s.str.

38. *Zygaena (Mesembrynus) hindukuschi* Koch, 1937

Zygaena hindukuschi Koch, 1937: Entomologische Zeitschrift. Frankfurt a. M. 51: 71.

Type material examined. Syntype 1♂ (ZMH 61460) (Fig. 38). „Nord-Ost-Hindukusch / Nuksan-Pass-Nordseite / Alpenwiesenzone / 3500–4000 m Mitte Juli / leg. H. & E.Kotzsch // *hindukuschi* / Koch. // Cotypus / *Zygaena* / *hindukuschi* / Koch // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61460”.

Type locality. Afghanistan (Badakhshan)

Current status. Valid species.

39. *Zygaena (Agrumenia) hiliaris lucifera* Reiss, 1936

Zygaena hiliaris ssp. *lucifera* Reiss, 1936: Entomologische Rundschau 54: 72.

Type material examined. Syntypes 6♂♀ (ZMH 61461–ZMH 61466) (Fig. 39). «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 61461»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 61462»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 61463»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 61464»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 61465»; «Cotypen // Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 61466».

Type locality. ‘Sierren um Albarracin’ [Spain: Teruel, Sierra de Albarracin]

Current status. Valid subspecies.

40. *Zygaena (Agrumenia) hiliaris lucifera* ab. *pseudocatalonica* Reiss, 1936

Zygaena hiliaris ssp. *lucifera* ab. *pseudocatalonica* Reiss, 1936: Entomologische Rundschau 54: 73.

Original material examined. Labelled as “Cotype” 1♂1♀ (ZMH 61467, ZMH 61470) (Fig. 40). «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Cotype // 1 f Cotype *lucifera* / ab. pseudocataloni- / ca Reiß 1936 // ZMH 61467“; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ab. *pseudo-* / *catalonica* Reiss // Type // Type m / *lucifera* Reiß / ab. pseudoca- / talonica Reiß / 1936 H.Reiss // ZMH 61470”.

Original locality. ‘Sierren um Albarracin’ [Spain: Teruel, Sierra de Albarracin]

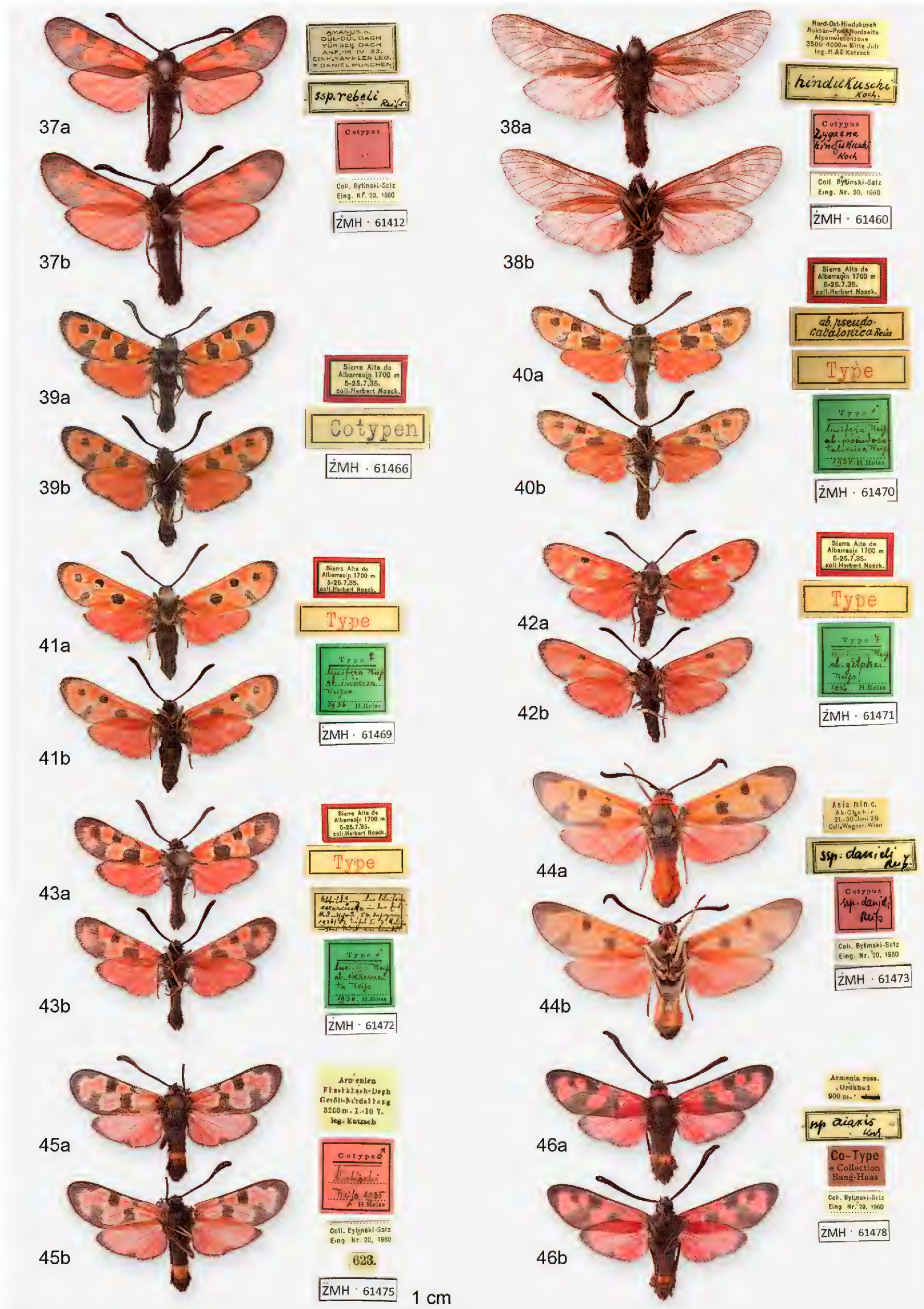
Current status. Infrasubspecific and hence unavailable name.

Remarks. Reiss (1936) proposed this name as an aberration of *Z. h. lucifera* Reiss, 1936. Therefore, as stated by Articles 45.6.1 and 45.6.2 (ICZN 1999) it is deemed to be infrasubspecific name – if author used “aberration”, “ab.”, “morph”, or the author expressly gave it infrasubspecific rank – which is hence unavailable.

41. *Zygaena (Agrumenia) hiliaris lucifera* ab. *inversa* Reiss, 1936

Zygaena hiliaris ssp. *lucifera* ab. *inversa* Reiss, 1936: Entomologische Rundschau 54: 73.

Original material examined. Labelled as “Type” 2♂♀ (ZMH 61468–ZMH 61469) (Fig. 41). «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ab. *inversa* Reiss // Type // Type m / *lucifera* Reiß / ab. *inversa* / Reiß / 1936. H.Reiss // ZMH 61468”; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert



Figures 37–46. 37. *Zygaena (Mesembrynus) graslini rebeli* Reiss, 1932; 38. *Zygaena (Mesembrynus) hindikuschi* Koch, 1937; 39. *Zygaena (Agrumenia) hilaris lucifera* Reiss, 1936; 40. *Zygaena (Agrumenia) hilaris lucifera* ab. *pseudocatalonica* Reiss, 1936; 41. *Zygaena (Agrumenia) hilaris lucifera* ab. *inversa* Reiss, 1936; 42. *Zygaena (Agrumenia) hilaris lucifera* ab. *gelpkei* Reiss, 1936; 43. *Zygaena (Agrumenia) hilaris lucifera* ab. *exarcuata* Reiss, 1936; 44. *Zygaena (Mesembrynus) laeta danieli* Reiss, 1935; 45. *Zygaena (Agrumenia) formosa kotzschii* Reiss, 1935; 46. *Zygaena (Mesembrynus) araxis* Koch, 1936

Noack. // Type // Type f / *lucifera* Reiß / ab. inversa / Reiß / 1936 H.Reiss // ZMH 61469”.

Original locality. ‘Sierren um Albarracin’ [Spain: Teruel, Sierra de Albarracin]

Current status. Infrasubspecific and hence unavailable name.

Remarks. Reiss (1936) proposed this name as an aberration of *Z. h. lucifera* Reiss, 1936. Therefore, as stated by Articles 45.6.1 and 45.6.2 (ICZN 1999) it is deemed to be infrasubspecific name – if author used “aberration”, “ab.”, “morph”, or the author expressly gave it infrasubspecific rank – which is hence unavailable.

42. *Zygaena (Agrumenia) hilaris lucifera* ab. *gelpkei* Reiss, 1936

Zygaena hilaris ssp. *lucifera* ab. *gelpkei* Reiss, 1936: Entomologische Rundschau 54: 73.

Original material examined. Labelled as “Cotype” 1♀ (ZMH 61471) (Fig. 42). “Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Type // Type f / *lucifera* Reiß / ab. *gelpkei* / Reiß / 1936 H.Reiss // ZMH 61471”.

Original locality. No type-locality mentioned in original description. This type comes from Sierra Alta de Albarracin.

Current status. Infrasubspecific and hence unavailable name.

Remarks. Reiss (1936) proposed this name as an aberration of *Z. hilaris lucifera* Reiss, 1936. Therefore, as stated by Articles 45.6.1 and 45.6.2 (ICZN 1999) it is deemed to be infrasubspecific name – if author used “aberration”, “ab.”, “morph”, or the author expressly gave it infrasubspecific rank – which is hence unavailable.

43. *Zygaena (Agrumenia) hilaris lucifera* ab. *exarcuata* Reiss, 1936

Zygaena (Agrumenia) hilaris lucifera ab. *exarcuata* Reiss, 1936: Entomologische Rundschau 54: 73.

Original material examined. Labelled as “Cotype” 1♂ (ZMH 61472) (Fig. 43). “Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Type // Type m / *lucifera* Reiß / ab. *exarcua* – / ta / Reiß / 1936 H.Reiss // ZMH 61472”.

Original locality. No type locality given for this taxon. This type comes from Sierra Alta de Albarracin.

Current status. Infrasubspecific and hence unavailable name.

Remarks. Reiss (1936) proposed this name as an aberration of *Z. hilaris lucifera* Reiss, 1936. Therefore, as stated by Articles 45.6.1 and 45.6.2 (ICZN 1999) it is deemed to be infrasubspecific name – if author used “aberration”, “ab.”, “morph”, or the author expressly gave it infrasubspecific rank – which is hence unavailable.

44. *Zygaena (Mesembrynus) laeta danieli* Reiss, 1935

Zygaena laeta danieli Reiss, 1935: Int. Ent. Z. 29: 159.

Type material examined. Syntype 1♂ (ZMH 61473) (Fig. 44). “Asia min.c. / Ak-Chehir / 21.–30.Juni 28 / Coll.Wagner-Wien // Cotypus / ssp. *danieli* / Reiß // ssp. *danieli* / Reiß // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61473”.

Type locality. ‘Marasch’ [Turkey: Kahraman Maraş]

Current status. Synonym of *Z. laeta akshehirensis* Reiss, 1929.

Remarks. Reiss (1935c) proposed this name as subspecies of *Zygaena laeta* (Hübner, 1790). The name was subsequently synonymized with current combination *Z. laeta akshehirensis* Reiss, 1929 (Hofmann and Tremewan 1996).

45. *Zygaena (Agrumenia) formosa kotschi* Reiss, 1935

Zygaena (Agrumenia) formosa kotschi Reiss, 1935: Int. Ent. Z. 28: 489.

Type material examined. Syntypes 3♂♂ (ZMH 61475– ZMH 61477) (Fig. 45). „Cotype m / *kotschi* / Reiß 1935 / H. Reiss // Armenien / Rharhkehash-Dagh / Geröll-Nordabbang / 3200m. 1.–10 7. / leg. Kotsch // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // 623. // ZMH 61475“; „Armenien / Rharhkehash-Dagh / Geröll-Südabbang / 3200m. 1.–10 7. / leg. Kotsch // Cotype // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // 624. // ZMH 61476“; „Cotype m / *kotschi* / Reiß 1935 / H. Reiss // Armenien / Rharhkehash-Dagh / Geröll-Südabbang / 3200m. 1.–10 7. / leg. Kotsch // *kotschi* / Reiß // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // 622. // ZMH 61477“.

Type locality. ‘Armenien, Khashkhash-Dagh’ [Turkey: Kars, Ağrı Dağ, Kash-kash Dağ].

Current status. Valid subspecies.

46. *Zygaena (Mesembrynus) araxis* Koch, 1936

Zygaena manlia ssp. *araxis* Koch, 1936: Dt. Ent. Z. Iris 50: 41.

Type material examined. Syntypes 2♂♂ (ZMH 61478– ZMH 61479) (Fig. 46). “Armenia ross. / Ordubad / 900 m. // Co-Type / e Collection / Bang-Haas // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ssp. *araxis* (written on label as ‘aiaxis’ [sic]) / Koch // ZMH 61478”; “Armenia ross. / Ordubad / 900 m. // Co-Type // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61479”.

Type locality. ‘Nus.nus bei Ordubad’ [Azerbaijan: Nakhichevan, near Orduba, Nyusnyus (Nus-nus)] (Hofmann and Tremewan 1996).

Current status. Valid species.

Remarks. *Zygaena araxis* is a valid species. According to Hofmann and Tremewan (2020) its taxonomic status has a confusing history. It was raised to species level by Görgner and Hofmann (1982), but subsequently

placed as a subspecies to *Z. rubricollis* Hampson, 1900 by Hofmann and Tremewan (1996). Finally, it was reinstated as a valid species by Keil (2003).

47. *Zygaena (Agrumenia) truchmena magnifica* Reiss, 1935

Zygaena magnifica Reiss 1935: Int. Ent. Z. 29: 41.

Type material examined. Syntypes 6♂♀ (ZMH 61480–ZMH 61485) (Fig. 47). “Buchará / Kurgantjube // Cotypus / *Z. magnifica* / Reiß // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61480”; “Buchará / Kurgantjube // Cotypus / *Z. magnifica* / Reiß // Coll. Warnecke / Eing. Nr. 5, 1949 // ZMH 61481”; “Kurgan Tjube / Buchará / 7.1934 // Cotype f / *magnifica* / Reiß / 1935 H.Reiss // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61482”. Kurgan Tjube / Buchará / Juli 1934. // Cotype m / *magnifica* / Reiß 1935 / H.Reiss // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61483”; “Kurgan Tjube / Buchará / 7.1934 // Cotype m / *magnifica* / Reiß / 1935 H. Reiss // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61484”. “Kurgan Tjube / Buchará / 7. 1934 // Cotype m / *magnifica* / Reiß / 1935. H. Reiss // *magnifica* / Reiß // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61485”.

Type locality. Kurgan-Tyube [Tajikistan].

Current status. Valid subspecies.

Remarks. Downgraded to subspecific rank. The current combination is *Z. truchmena magnifica* Reiss 1935 (Hofmann and Tremewan 1996).

48. *Zygaena (Zygaena) lonicerae stettinensis* Reiss, 1922

Zygaena lonicerae stettinensis Reiss, 1922: Int. Ent. Z. 16: 66.

Type material examined. Syntypes 1♂1♀ (ZMH 61486–ZMH 61487) (Fig. 48). “Hoekendorf / H. Rüffer. / 2.8.22. // Cotype f / *stettinensis* / Reiß / 1922 H. Reiss // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61486”. “Hoekendorf / H. Rüffer. / 5.8.22. // v. *stettinensis* / Reiss // Cotype m / *stettinensis* / Reiss / 1922 H.Reiss // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61487”.

Type locality. Stettin [Poland].

Current status. Synonym of *Z. lonicerae lonicerae* (Scheven, 1777).

Remarks. Reiss (1922) proposed this name as a subspecies of *Z. lonicerae* (Scheven, 1777), but this subspecific name was synonymized with *Z. lonicerae lonicerae* (Scheven, 1777) (Hofmann and Tremewan 1996).

49. *Zygaena (Zygaena) lavandulae barcelonica* Reiss, 1936

Zygaena lavandulae barcelonica Reiss, 1936: Entomologische Rundschau 54: 71.

Type material examined. Syntypes 1♂1♀ (ZMH 61488–ZMH 61489) (Fig. 49). “? / Cotype m / *barcelonica* / Reiß / 1936 H. Reiss // ssp. *barcelonica* / Reiß // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61488”; “Barcelona

/ a. ? // Cotype f / *barcelonica* / Reiß / 1936. H.Reiss // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61489”.

Type locality. Barcelona [Spain].

Current status. Valid subspecies.

50. *Zygaena (Zygaena) meliloti silaecola* Verity, 1930

Zygaena meliloti silaecola Verity, 1930: Memorie della Societa Entomologica Italiana 9: 12.

Original material examined. “Cotypes” 4♂♂ (ZMH 61490–ZMH 61493) (Fig. 50). “CALABRIA / bassingliatella oder Cassugliatella / 6.VIII.21 / ? // v. *silaecola* / Vrtty // “Cotypus” / v. / *silaecola* / Vrtty // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61490”; “CALABRIA / bassingliatella oder Cassugliatella / 6.VIII.21 / ? // “Cotypus” / v. / *silaecola* / Vrtty // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61491”; “CALABRIA / bassingliatella oder Cassugliatella / 1.VIII.21 / ? // “Cotypus” / v. / *silaecola* / Vrtty // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61492”; “CALABRIA / Bassigliabblo / 10.VII.21 / ? // “Cotypus” / v. / *silaecola* / Vrtty // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61493”.

Original locality. Italy: Calabria, Cosenza, La Sila [for *Anthrocera meliloti silana* Turati, 1923]

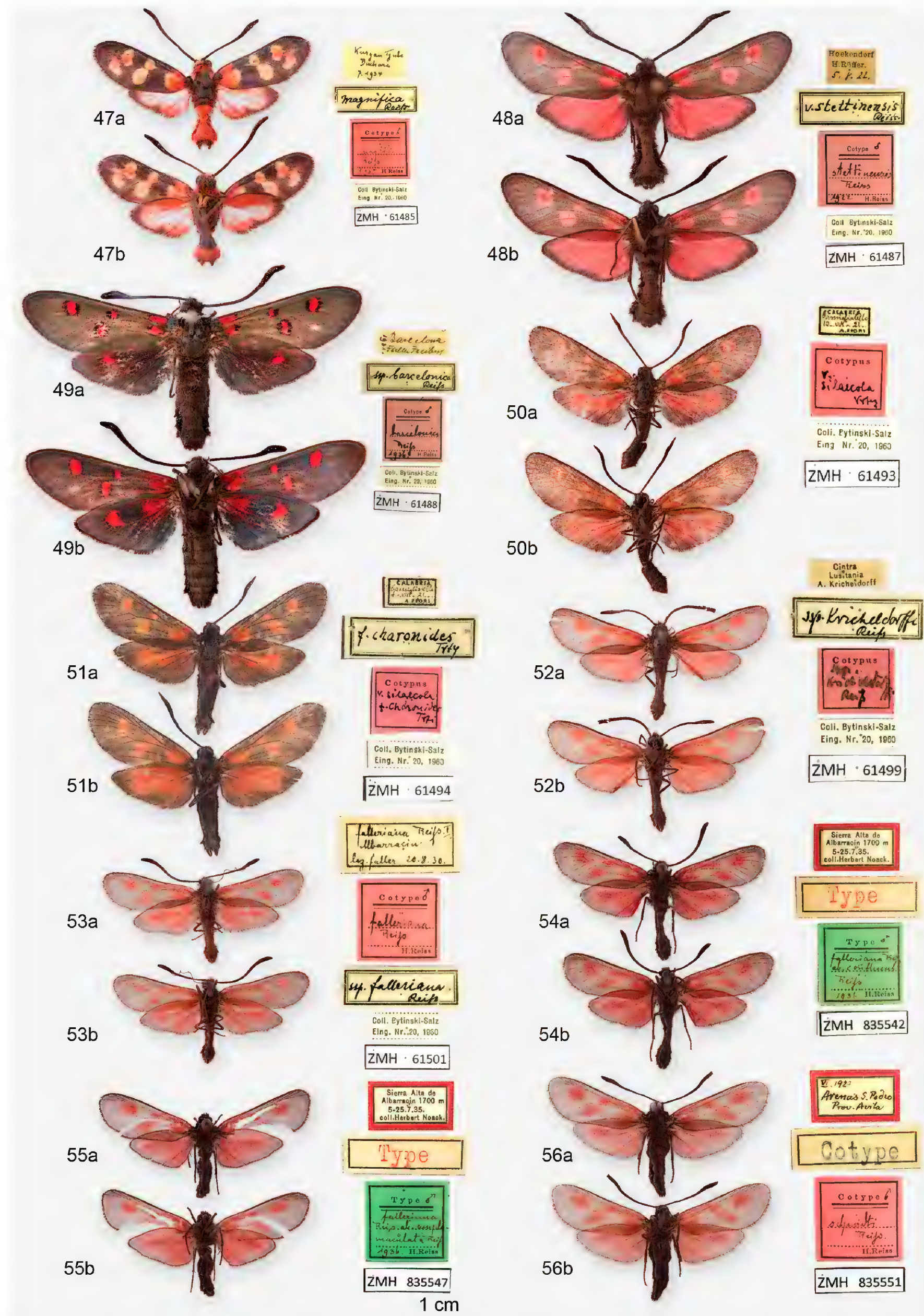
Current status. Synonym of *Z. viciae sicula* Calberla, 1895.

Remarks. *Zygaena meliloti* (Esper, 1789) is a junior synonym to *Zygaena viciae* (Denis & Schiffermüller, 1775). The taxon *silaecola* Verity, 1930 was proposed as an objective replacement name for *Anthrocera meliloti silana* Turati, 1923, which is a junior secondary homonym to *Zygaena lonicerae silana* Burgeff, 1914. However, the taxon *silaecola* Verity, 1930 is a junior synonym to *sicula* Calberla, 1895. The current combination of this taxon is therefore *Z. viciae sicula* Calberla, 1895 (Hofmann and Tremewan 1996). Moreover, as the reviewer Alberto Zilli correctly states, if the type status of specimen(s) in case an original name has objectively been replaced which is the case here as the name *silaecola* Verity, 1930 is stated to be a replacement for *silana* Turati, 1923 due to the latter entering homonymy with another name. In this case, ICZN article 72.7 clearly state that the type specimens remain those of the original name regardless of any statement to the contrary (e.g. other specimens named as types). Accordingly, the listed ‘types’ are such only if they are part of the original Turati’s series, if they are part of another series worked upon by Verity they are not true types of *silaecola*. Consequently, the ‘types’ listed above are incorrectly labelled as types.

51. *Zygaena (Zygaena) meliloti subglockneriana* f. *charonides* Reiss, 1943

Zygaena meliloti ssp. *subglockneriana* f. *charonides* Reiss, 1943: Z. Wien. Ent. Ges. 28: 108.

Original material examined. Labelled as “Cotype” 3♂♂ (ZMH 61494–ZMH 61496) (Fig. 51). “CALABRIA



Figures 47–56. 47. *Zygaena (Agrumenia) truchmena magnifica* Reiss 1935; 48. *Zygaena (Zygaena) lonicerae stettinensis* Reiss, 1922; 49. *Zygaena (Zygaena) lavandulae barcelonica* Reiss, 1936; 50. *Zygaena (Zygaena) meliloti silaecola* Verity, 1930; 51. *Zygaena (Zygaena) meliloti subglockneriana* f. *charonides* Reiss, 1943; 52. *Zygaena nevadensis kricheldorffi* Reiss, 1933; 53. *Zygaena nevadensis falleriana* Reiss, 1931; 54. *Zygaena nevadensis falleriana* ab. *confluens* Reiss, 1936; 55. *Zygaena nevadensis falleriana* ab. *amplomaculata* Reiss, 1936; 56. *Zygaena nevadensis schmidtii* Reiss, 1931.

/ bassingliatella oder Cassugliatella / 4.VIII.21 / ? // f. charonides / Trty // Cotypus / v. silaecola / f. charonides / Trti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61494”; “CALABRIA / Jossiata / 6.VIII.21 / A.FIGRI // Cotypus / v. *silaecola* / f. charonides / Trti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61495”; “CALABRIA / bassingliatella oder Cassugliatella / 4.VIII.21 / ? // Cotypus / v. *silaecola* / f. charonides / Trti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61496”.

Original locality. ‘Kleine Fleiß, Großglocknergebiet’ [Austria: Carinthia, Grossglockner Region, Kleines Fleisstal].

Current status. Intrasubspecific and hence unavailable name.

Remarks. The taxon *charonoides* Reiss, 1943 was described as a ‘forma’ (an aberration) of *Zygaena meliloti subglockneriana* Reiss 1943 (now *Z. viciae subglockneriana* Reiss 1943 (Hofmann and Tremewan 1996)). According to Article 45.6.4., the author expressly gave it infrasubspecific rank, in which case it is infrasubspecific, and hence unavailable.

52. *Zygaena nevadensis kricheldorffi* Reiss, 1933

Zygaena nevadensis kricheldorffi Reiss, 1933: Die Gross-Schm. der Erde, Sup. 2: vii: 252.

Type material examined. Syntypes 2♂♂ (ZMH 61499–ZMH 61500) (Fig. 52). “Cintra / Lusitania / A. Kricheldorff // Cotypus / ssp. *kricheldorffi* / Reiß // ssp. *kricheldorffi* / Reiß // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61499”; “Guarda / Lusitania / A. Kricheldorff // Cotypus / *Z. nevadensis* / ssp. *kricheldorffi* / Reiß // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61500”.

Type locality. Beira Alta, Guarda [Portugal].

Current status. Synonym of *Z. nevadensis schmidtii* Reiss, 1931.

Remarks. The taxon *kricheldorffi* Reiss, 1933 was described as a subspecies of *Z. (Silvicola) nevadensis* Rambur, 1858. Hofmann and Tremewan (1996) treated it as a synonym of *Z. nevadensis schmidtii* Reiss, 1931 (type locality: Spain: Avila, Sierra de Gredos, vicinity of Arenas de San Pedro), which is the current valid combination.

53. *Zygaena nevadensis falleriana* Reiss, 1931

Zygaena nevadensis falleriana Reiss, 1931: Int. Ent. Z. 25: 111.

Type material examined. Syntype 1♂ (ZMH 61501) (Fig. 53). “*falleriana* Reifs I / Albarracin / leg. faller 20.8.30 // Cotype m / *falleriana* / Reifs / H.Reiss // ssp. *falleriana* / Reifs // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61501”.

Type locality. Sierra Noguera, Albarracin [Spain: Teruel].

Current status. Synonym of *Z. nevadensis nevadensis* Rambur, 1858.

Remarks. The taxon *falleriana* Reiss, 1931 is a junior synonym of the nominotypical *Z. nevadensis nevadensis* Rambur, 1858 (Hofmann and Tremewan 1996).

54. *Zygaena nevadensis falleriana* ab. *confluens* Reiss, 1936

Zygaena nevadensis ssp. *falleriana* ab. *confluens* Reiss, 1936: Entomologische Rundschau 54: 29.

Original material examined. Labelled as “Type / Cotype” 2♂♂ (ZMH 835542–ZMH 835543) (Fig. 54). “Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Type // Type m / *falleriana* Reiß / ab. *confluens* / Reiß / 1936 H.Reiss // ZMH 835542”; “Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Cotype // ZMH 835543”.

Original locality. ‘Sierra Alte de Albarracin, 1750 m’ [Spain: Teruel, Albarracin, Sierra Alta].

Current status. Intrasubspecific and hence unavailable name.

Remarks. Reiss (1936) proposed this name as an aberration of *Z. nevadensis falleriana* Reiss, 1931. Therefore, as stated by Article 45.6.1 (ICZN 1999) it is deemed to be infrasubspecific name – if its author expressly gave it infrasubspecific rank – which is hence unavailable.

55. *Zygaena nevadensis falleriana* ab. *amplomaculata* Reiss, 1936

Zygaena nevadensis ssp. *falleriana* ab. *amplomaculata* Reiss, 1936: Entomologische Rundschau 54: 29.

Original material examined. Labelled as “Type / Cotype” 4♂♀ (ZMH 835547–ZMH 835550) (Fig. 55). “Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Type // Type m / *falleriana* / Reiß ab. *amplomaculata* Reiß / 1936 H.Reiss // ZMH 835547”; “Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Cotypen // ZMH 835548”; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 835549»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Type // Type f / *falleriana* Reiß / ab. *amploma- / culata* Reiß / 1936 H.Reiss // ZMH 835550”.

Original locality. ‘Sierra Alte de Albarracin, 1750 m’ [Spain: Teruel, Albarracin, Sierra Alta].

Current status. Intrasubspecific and hence unavailable name.

Remarks. Reiss (1936) proposed this name as an aberration of *Z. nevadensis falleriana* Reiss, 1931. Therefore, as stated by Article 45.6.1 (ICZN 1999) it is deemed to be infrasubspecific name – if its author expressly gave it infrasubspecific rank – which is hence unavailable.

56. *Zygaena nevadensis schmidtii* Reiss, 1931

Zygaena nevadensis schmidtii Reiss, 1931: Int. Ent. Z. 25: 112.

Type material examined. Syntype 1♂ (ZMH 835551) (Fig. 56), “VI. 1927 / Arenas S. Padeo / Prov. Avila // Cotype // Cotype m / *schmidtii* / Reiß / H.Reiss // ZMH 835551”.

Type locality. ‘Vorberge der Sierra de Gredos Umgebung Arenas St. Pedro, Prov. Avila, westlich Madrid’

[Spain: Sierra de Gredos, Avila, vicinity of Arenas de San Pedro] (Hofmann and Tremewan 1996).

Current status. Valid subspecies.

57. *Zygaena zapateri* Reiss, 1936

Zygaena zapateri Reiss, 1936: Entomologische Rundschau 54: 57.

Type material examined. Syntypes 4♂♂ (ZMH 835552–ZMH 835555) (Fig. 57). «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Cotypen // ZMH 835552»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 835553»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 835554»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 835555».

Type locality. ‘Albarracin’ [Spain: Teruel, vicinity of Albarracin] (Hofmann and Tremewan 1996).

Current status. Synonym of *Z. sarpedon carmencita* Oberthür, 1910.

Remarks. The taxon *Z. zapateri* was synonymised with *Z. sarpedon carmencita* Oberthür, 1910 by Hofmann and Tremewan (1996).

58. *Zygaena sarpedon leuensis* ab. *quinquepuncta* Reiss, 1958

Zygaena sarpedon leuensis ab. *quinquepuncta* Reiss, 1958: Bulletin de la Société entomologique de Mulhouse 1958: 47.

Original material examined. Labelled as “Cotype” 3♂♂ (ZMH 835556–ZMH 835558) (Fig. 58). «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Cotypen // ZMH 835556»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 835557»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 835558».

Original locality. Not mentioned. The three syntypes are from the ‘Sierra Alta de Albarracin’.

Current status. Infrasubspecific and hence unavailable name.

Remarks. Reiss (1958) proposed this name as an aberration of *Z. s. leuensis* Dujardin, 1956. Therefore, as stated by Article 45.6.1 (ICZN 1999) it is deemed to be infrasubspecific name – if its author expressly gave it infrasubspecific rank – which is hence unavailable.

59. *Zygaena zapateri* ab. *rubrior* Reiss, 1958

Zygaena zapateri ab. *rubrior* Reiss, 1958: Bulletin de la Société entomologique de Mulhouse 1958: 47.

Original material examined. Labelled as “Type / Cotype” 3♂♂ (ZMH 835559–ZMH 835561) (Fig. 59). «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Type // Type m / *zapateri* ab / *rubrior* Reiß / 1936 / H. Reiss // ZMH 835559»; “Dr. Geipke // Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll.

Herbert Noack. // Cotypen // ZMH 835560»; “Dr. Geipke // Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 835561”.

Original locality. “Sierra Alta de Albarracin” [Spain: Teruel, Albarracin, Sierra Alta, 1700 m].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Reiss (1958) proposed this name as an aberration of *Z. zapateri* Reiss, 1936. Therefore, it is deemed to be infrasubspecific, it is hence unavailable (Article 45.6.2, ICZN 1999).

60. *Zygaena achilleae* ab. *rubrescens* Reiss, 1922

Esp. ab. *rubrescens* Reiss, 1922: Int. Ent. Z. 16: 84.

Original material examined. Labelled as “Type / Cotype” 5♂♂ (ZMH 835564–ZMH 835568) (Fig. 60). «Italia central. / 15/7 Majella 27 / 2400m / coll. F. Dannehl // 15.7.1927 / majella / Central-Italien // ZMH 835563»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Type // Type f / *aragoneusis* / Bgr. ab. *rubres-* / *cens* Reiß / 1936 H. Reiss // ZMH 835564»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 835565»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Cotypen // ZMH 835566»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 835567»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 835568».

Original locality. Sierra Alta de Albarracin” [Spain: Teruel, Albarracin, Sierra Alta, 1700 m].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Reiss (1922) proposed this name as an aberration of *Zygaena achilleae* (Esper, 1780). Therefore, it is deemed to be infrasubspecific, it is hence unavailable (Article 45.6.2, ICZN 1999).

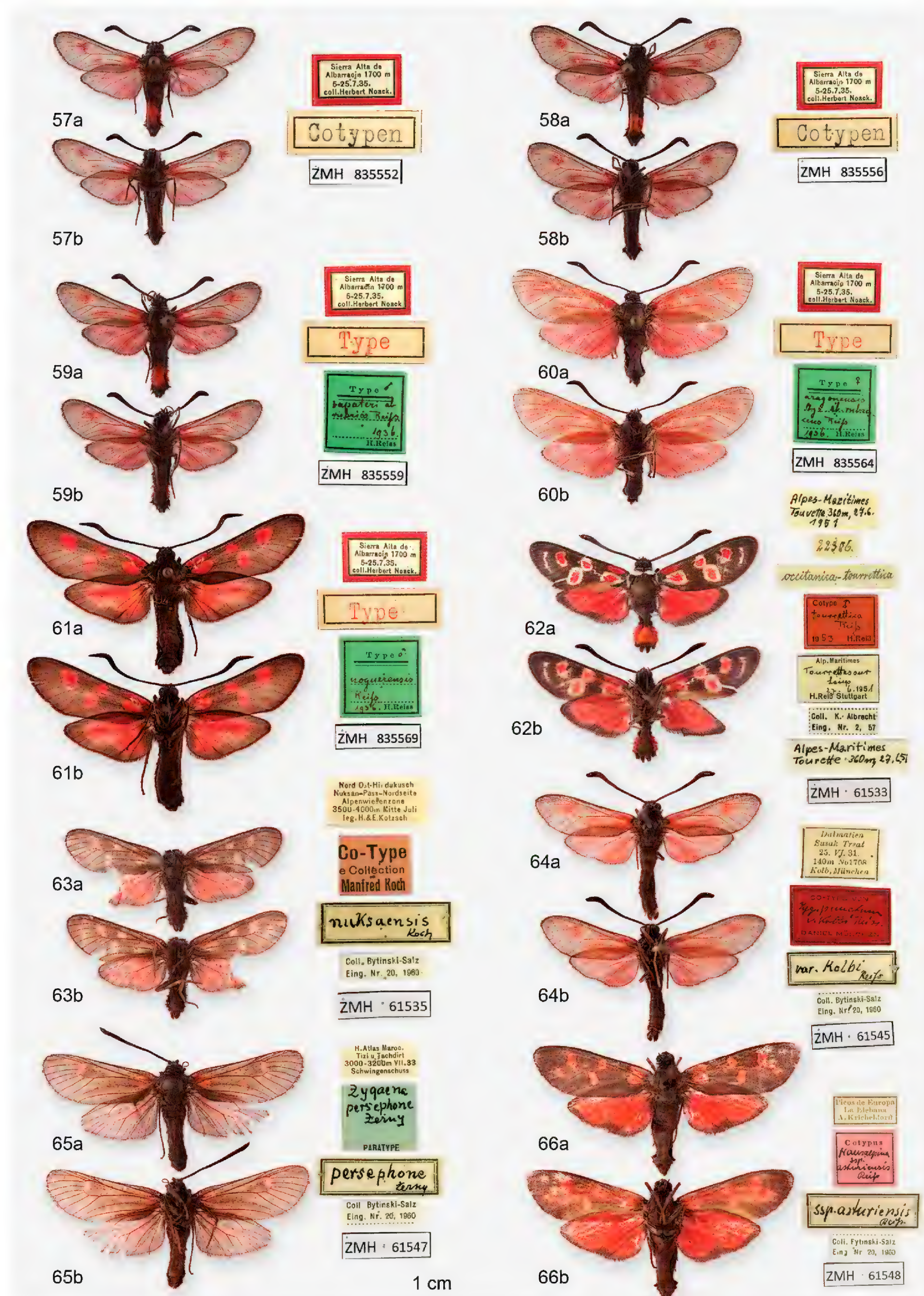
61. *Zygaena trifolii noguerensis* Reiss, 1936

Zygaena trifolii var. *noguerensis* Reiss, 1936: Entomologische Rundschau 54: 89.

Type material examined. Syntypes 4♂♀ (ZMH 835569–ZMH 835572) (Fig. 61). «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Type // Type m / *noguerensis* / Reiß / 1936 H. Reiss // ZMH 835569»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Type // Type f / *noguerensis* / Reiß / 1936 H. Reiss // ZMH 835570»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // Cotypen // ZMH 835571»; «Sierra Alta de / Albarracin 1700 m / 5–25.7.35. / coll. Herbert Noack. // ZMH 835572».

Type locality. ‘Sierra Alta de Albarracin, 1750 m’ [Spain: Teruel, Sierra Alta, Albarracin] (Hofmann and Tremewan 1996)

Current status. Synonym of *Zygaena trifolii barcelonensis* Reiss, 1922.



Figures 57–66. 57. *Zygaena zapateri* Reiss, 1936; 58. *Zygaena sarpedon leuzensis* ab. *quinquepuncta* Reiss, 1958; 59. *Zygaena zapateri* ab. *rubrior* Reiss, 1958; 60. *Zygaena achilleae* ab. *rubescens* Reiss, 1922; 61. *Zygaena trifolii noguerensis* Reiss, 1936; 62. *Zygaena (Agrumenia) occitanica tourettica* Reiss, 1953; 63. *Zygaena (Agrumenia) transpamirina nuksanensis* Koch, 1937; 64. *Zygaena (Mesembrynus) punctum kolbi* Reiss, 1933; 65. *Zygaena (Zygaena) persephone* Zerny, 1934; 66. *Zygaena (Zygaena) transalpina asturiensis* Reiss, 1936.

Remarks. Reiss (1936) proposed this name as a variation of *Z. trifolii* (Esper, 1783) from Teruel, Sierra Alta, Albarracín (Spain). According to Article 45.6.4., it is subspecific if first published before 1961 and author expressly used the terms “variety”. The taxon *noguerensis* Reiss, 1936 is a junior synonym to *Zygaena trifolii barcelonensis* Reiss, 1922 (Hofmann and Tremewan 1996).

62. *Zygaena (Agrumenia) occitanica tourettica* Reiss, 1953

Zygaena occitanica tourettica Reiss, 1953: Entomologische Zeitschrift. Frankfurt a. M. 63: 111.

Type material examined. Syntypes 1♂ 1♀ (ZMH 61533–ZMH 61534) (Fig. 62). “22306. // *occitanica-tourettica* // Cotype m / *tourettica* / Reiß / 1953 H. Reiß // Alp. Maritimes / Tourrettesur / Loisy / 27.6.1951 / H. Reiß Stuttgart // Coll. K. Albrecht / Eing. Nr. 2, 57 // Alpes-Maritimes / Tourette 360m, 27.6.51 // Alpes-Maritimes / Tourette 360m, 27.6. / 1951 // ZMH 61533”; “O.l.p. Maritimes / Tourrettes. Loup / 360m 1.7.1951 / H. Reiß Stuttgart // 22307. // Cotype f / *tourettica* / Reifs / 1953 H. Reiß // Alpes-Mirittimes / Torette Tourette 27.6.51 // Coll. K. Albrecht / Eing. Nr. 2, 57 // ZMH 61534”.

Type locality. Tourettes-sur-Loup [France: Alpes-Maritimes].

Current status. Synonym of *Z. occitanica praematura* Przegendza, 1932.

Remarks. The taxon *tourettica* Reiss, 1953 is a junior synonym to *Z. occitanica praematura* Przegendza, 1932 (Hofmann and Tremewan 1996).

63. *Zygaena (Agrumenia) transpamirina nuksanensis* Koch, 1937

Zygaena nuksanensis Koch, 1937: Entomologische Zeitschrift. Frankfurt a. M. 51: 61.

Type material examined. Syntype 1♂ (ZMH 61535) (Fig. 63). “Nord-Ost-Hindukusch / Nuksan-Pass-Nordseite / Alpenwiesenzone / 3500-4000m Mittel Juli / leg. H. & E. Kotzsch // Co-Type / e Collection / Manfred Koch // *nuksanensis* / Koch // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61535”.

Type locality. Noqšan An [Afghanistan: Badakhshan, NE Hindukush, Nuksan-Pass].

Current status. Valid subspecies.

Remarks. *Zygaena nuksanensis* Koch, 1937 is currently considered to represent a valid subspecies of *Z. transpamirina* Koch, 1936 (Hofmann and Tremewan 1996).

64. *Zygaena (Mesembrynus) punctum kolbi* Reiss, 1933

Zygaena (Hyalia) punctum var. *kolbi* Reiss, 1933: Die Gross-Schm. der Erde, Sup. 2: vii: 255.

Type material examined. Syntypes 2♂♂ (ZMH 61545–ZMH 61546) (Fig. 64). „Dalmatien / Susak Trsat / 25.VI.31. / 140m No1708 / Kolb, München // CO-TYPE VON *Zyg.*

punctum / v. *Kolbi* Reiss. / DANIEL / MÜNCHEN // var. *Kolbi* / Reifs // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61545“; „Dalmatien / Susak Trsat / 25.VI.31. / 140m No1708 / Kolb, München // CO-TYPE VON *Zyg. punctum* / v. *kolbi* Reiss. / DANIEL / MÜNCHEN // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61546”.

Type locality. ‘Fiume (Susak Trsat)’ [Croatia: vicinity of Rijeka, Susak Trsat].

Current status. Synonym of *Z. punctum itala* Burgeff, 1926.

Remarks. Reiss (1933) proposed this name as a variation of *Z. punctum* Ochsenheimer, 1808 from Fiume (Croatia). According to Article 45.6.4., it is subspecific if first published before 1961 and author expressly used the terms “variety”. The taxon *kolbi* Reiss, 1933 was synonymised with *Z. punctum itala* Burgeff, 1926 by Hofmann and Tremewan (1996). This is the current valid combination. However, the taxonomic position of the subspecies of *Z. punctum* from the Balkans is currently again revised (Nahirnić, Jakšić and Tarmann, in preparation).

65. *Zygaena (Zygaena) persephone* Zerny, 1934

Zygaena persephone Zerny, 1934: Z. Öst. Ent. Ver. 19: 108, 200.

Type material examined. Paratype 1♂ (ZMH 61547) (Fig. 65). “H. Atlas Maroc. / Tizi u Tachdirt / 3000–3200 m VII.33 / Schwingenschuss // *Zygaena* / *persephone* / Zerny / Paratype // *persephone* / Zerny // Coll Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61547”.

Type locality. ‘Großer Atlas, Tizi’n Tachedirt (auch Tizi’n Yabessen genannt)’ [Morocco: Haut-Atlas, Djebel Toubkal region, Tizi-n-Tachedirt].

Current status. Valid species.

66. *Zygaena (Zygaena) transalpina asturiensis* Reiss, 1936

Zygaena transalpina asturiensis Reiss, 1936: Entomologische Rundschau 54: 91.

Type material examined. Syntypes 3♂♂ (ZMH 61548 – ZMH 61550) (Fig. 66). “Cotypus / *transalpina* ssp. *asturiensis* / Reifs // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61549”; “Picos de Europa / La Liebana / A. Kricheldorf // Cotypus / *transalpina* ssp. *asturiensis* / Reifs // ssp. *asturiensis* / Reiß // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61548”; “Picos de Europa / La Liebana / A. Kricheldorf // Cotypus / *transalpina* ssp. *asturiensis* / Reifs // Coll Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61550”.

Type locality. ‘Picos de Europa in Nordspanien, La Liebana’ [Spain: Picos de Europa, Cantabria, vicinity of la Vega de Liébana] (Hofmann and Tremewan, 1996).

Current status. Synonym of *Z. transalpina rupicola* Rocci, 1936.

Remarks. A junior synonym to *Z. transalpina rupicola* Rocci, 1936. Rocci’s work was published in May 1936, whereas the paper of Reiss (1936) in November 1936 (Hofmann and Tremewan 1996).

67. *Zygaena (Agrumenia) sogdiana altissima* Burgeff, 1914

Zygaena fraxini var. *altissima* Burgeff, 1914: 51.

Type material examined. Syntypes 8♂♀ (ZMH 61552–ZMH 61559) (Fig. 67). “Alai mont. / 1905 Korb // Cotypus / *altissima* / Bgff // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61552”; “Alai mont. // Cotypus / *sogdiana* / *altissima* / Bgff // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61553”; “Alai mont. / 1905 Korb // Cotypus / *sogdiana* / *altissima* / Bgff // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61554”; “Alai mont. / 1905 Korb // Cotypus / *sogdiana* / *altissima* / Bgff // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61555”; “Alai mont. / 1905 Korb // Cotype f / *altissima* / Bgff / H.Reiss // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61556”; “Alai mont. // Cotype m / *altissima* / Bgff / H. Reiss // v. *altissima* / Bgff // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61557”; “Alai mont. / 1905 Korb // Cotypus / *altissima* / Bgff // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61558”; “Alai mont. / 1905 Korb // Cotypus / *sogdiana* / *altissima* / Bgff // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61559”.

Type locality. ‘Trans-Alaikette, Ak-Bassegha, in einer Höhe von 2000 m’ [TransAlai near Tajikistan border].

Current status. Valid subspecies.

Remarks. Burgeff (1914) proposed this name as a variation of *Z. fraxini* Ménétriés, 1832 from Tajikistan. According to Article 45.6.4., it is subspecific if first published before 1961 and author expressly used the terms “variety”. The taxon *altissima* Burgeff, 1914 has been transferred to *Zygaena ransalp* Erschoff, 1874. The current combination is *Z. ransalp altissima* Burgeff, 1914 (Hofmann and Tremewan 1996).

68. *Zygaena (Agrumenia) rosinae* Korb, 1903

Zygaena rosinae Korb, 1903: 326.

Type material examined. Syntypes 2♂♂ (ZMH 61569–ZMH 61570) (Fig. 68). “R. drenonien / Kulp. / Korb // Rosinae // Cotype m / *rosinae* / Korb // H.Reiss. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61569”; “R. Armen / Kulp. / 1901 Korb // Cotypus / *Z. rosinae* / m Korb // *rosinae* / Korb. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61570”.

Type locality. ‘Russisch-Armenien, Kulp’ [Turkey: Kars, Tuzluca].

Current status. Valid species.

69. *Zygaena (Zygaena) transalpina sorrentina* f. *aureomaculata* Stauder, 1921

Zygaena transalpina sorrentina forma *aureomaculata* Stauder, 1921: 30

Original material examined. Labelled as “Type” 1♂ (ZMH 61573) (Fig. 69). “Type // 1/6 / Ital. mer. Goo m. / penins. Surrentina / M. Faito 1921 oder // H. Stauder

legit. // f. *aureomacula* / ta Hauder // aureomaculata // Sig. G. Warnecke / Eing. Nr 5, 1949 // ZMH 61573”.

Original locality. ‘M. Faito bei Castellamare di Stabia, 800–900 m’ [Italy: Campania, Napoli, Monte Faito, south of Castellamare di Stabia].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Described as a golden-yellow form of *Zygaena ransalpina sorrentina* with a remark by Stauder (1921) that this form may be an aberration caused by high temperature. According to Article 45.6.4., the author expressly gave it infrasubspecific rank, in which case it is infrasubspecific, and hence unavailable.

Unpublished, unavailable names

70. *Zygaena exulans* v. *amarensis* Diehl

Material examined. Labelled as “Cotypes” 2♂♂ (ZMH 835562–ZMH 835563) (Fig. 70). “Italia central. / 27 Majella 15/7 / 2400m / coll. F. Dannehl // Cotypen // 15.7.1927 / majella / Central-Italien // ZMH 835562”; “Italia central. / 15/7 Majella 27 / 2400m / coll. F. Dannehl // 15.7.1927 / majella / Central-Italien // ZMH 835563”.

Current status. “in litteris” name and hence not available.

Remarks. This taxon was never published. Diehl originally intended to describe the population from the Abruzzi in central Italy. Later he obviously realised that Burgeff (1926) had already named it a year before Dannehl collected these two specimens (1927). But even Burgeff’s name (subsp. *Abruzzina*) is not based on the discovery, as it was (and still is) a ransalpin name of a former homonymic name (subsp. *Apennina* Rebel, 1910, preoccupied by *apennina* Turati, 1884, a subsp. Of *Z. carniolica*) (Axel Hofmann pers. comm.).

71. *Zygaena (Zygaena) transalpina nigraltudinaria* ab. *Flava* Rocci, 1937

Material examined. Labelled as “Type” 1♂ (ZMH 61551) (Fig. 71). “Breth / Küstenland / 9/8 05 // ex. Coll. / Ronnicke / TYPE // ab. Flava. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61551”.

Current status. “in litteris” name and hence not available.

Remarks. There is no *Zygaena ransalpina hilfi* ab. Flava Rocci, 1936 published anywhere. Therefore, this material is no type-material in the sense of the Zoological Nomenclature.

72. *Zygaena (Zygaena) transalpina sorrentina* v. *eranesceus* Sicher, 1906

Material examined. Labelled as “Type” 1♂ (ZMH 61572) (Fig. 72). “Type // 1/6 / Ital. mer. Goo m. / penins.



Figures 67–74. 67. *Zygaena (Agrumenia) sogdiana altissima* Burgeff, 1914; 68. *Zygaena (Agrumenia) rosinae* Korb, 1903; 69. *Zygaena (Zygaena) transalpina sorrentina* v. *aureomaculata* Stauder, 1921; 70. *Zygaena exulans* v. *amarensis* Diehl; 71. *Zygaena (Zygaena) transalpina nigraltudinaria* ab. *flava* Rocci, 1937; 72. *Zygaena (Zygaena) transalpina sorrentina* v. *eranesceus* Sicher, 1906; 73. *Zygaena (Zygaena) transalpina litorea* v. *flava* Stauder; 74. *Zygaena (Mesembrynus) purpuralis* v. *asupinensis* Byt.-S.

Sorrento / M.Faito 1921 oder // H. Stauder legit. // f. *eranesceus* / Stauder // Sig. G Warnecke / Eing. Nr. 5, 1949 // // ZMH 61572“.

Current status. “in litteris” name and hence not available.

Remarks. This taxon is missing in all known catalogues. In Sicher (1906) it is not mentioned either. Mag.

H. Bruckner from the library of the Natural History Museum in Vienna (Naturhistorisches Museum, Wien, Austria) checked every page of the volume of the Jahresberichte des Wiener Entomologischen Vereins, Volume 16 (1905) and could not find any other paper, nor note from Sicher. We think that the specimen was pre-labelled as type, but Sicher finally did not describe it.

73. *Zygaena (Zygaena) transalpina litorea* v. *flava* Stauder

Material examined. Labelled as “Cotypes” 5♂♀ (ZMH 61574–ZMH 61578) (Fig. 73). « ex. flava / e.l. / 11.4.30. // ex. coll. Ronnicke / Cotype // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61574 » ; « Italia / Brescia 19 / P. Ronnicke // ex. flava / e.l. / 30.6.30. // ex coll. / Ronnicke / Cotype // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61575 » ; « Italia / Brescia 19 / P. Ronnicke // ex. flava / e.l. / 5.6.30. // ex coll. / Ronnicke / Cotype // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61576 » ; « ex. flava / e.l. / 11.6.30. // ex. coll. Ronnicke / Cotype // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61577 » ; « Italia / Brescia 19 / P. Ronnicke // ex. flava / e.l. / 4.6.30. // ex coll. / Ronnicke / Cotype // ab. Flava / Ronnicke // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61578”.

Current status. “in litteris” name and hence not available.

Remarks. In all publications of Stauder there is no such taxon mentioned.

74. *Zygaena (Mesembrynus) purpuralis* v. *asupinensis* Bytinski-Salz

Material examined. Labelled as “Cotypes” 9♂♀ (ZMH 61536–ZMH 61544) (Fig. 74). “Rovigno d’Istria / 6.1934 / Dr. H. Bytinski-Salz // Cotypus // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61536”; “Rovigno d’Istria / 6.1934 / Dr.H.Bytinski-Salz // Cotypus // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61537”; “Rovigno d’Istria / 6.1934 / Dr. H. Bytinski-Salz // Cotypus // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61538”; “Rovigno d’Istria / 6.1934 / Dr.H.Bytinski-Salz // Cotypus // var. asupinensis / By.5. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61539”; “Rovigno d’Istria / 6.1933 / Dr. H. Bytinski-Salz // Cotypus // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61540”; “Rovigno d’Istria / 6.1934 / Dr. H. Bytinski-Salz // Cotypus // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61541”; “Rovigno d’Istria / 1.–6.6.1933 / Dr. H. Bytinski-Salz // Cotypus // Coll. Bytinski-Salz // Coll. Bytinski-Salz // Eing. Nr. 20, 1960 Eing. // ZMH 61542”; “Brioni / Istrien / 28.V.1934 / Dr. H. Bytinski-Salz // Cotypus // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61543”; “Rovigno d’Istria / 1.–6.VI.1933 / Dr. H. Bytinski-Salz // Cotypus // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61544”.

Current status. “in litteris” name and hence not available.

Remarks. This taxon cannot be found in the literature.

Subfamily Chalcosiinae Walker, 1865

75. *Aglaope labasi meridionalis* Zerny, 1934

Aglaope labasi meridionalis Zerny, 1934: Z. Öst. Ent. Ver. 19: 29

Type material examined. Paratype 1♂ (ZMH 61474) (Fig. 75). “H. Atlas Maroc. / Tachdirt 2300– / 2700 m 3.–25.VII.33 / Schwingenschuss // *Aglaope / labasi* / ssp. *meridio- / nalis* Zerny / PARATYPE // ssp. *meridionalis* / Zerny // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61474”.

Type locality. ‘Auf dem Wege nach Tachdirt zum Tiz’n Tachdirt’ [Morocco: Haut-Atlas, Djebel Toubkal region, between Tacheddirt and Tizi-n-Tacheddirt, 2700–2800 m].

Current status. Valid subspecies.

Subfamily Procridinae Boisduval, 1828

76. *Adscita alpina* (Alberti, 1937)

Procris alpina Alberti, 1937: Ent. Z. 50 (1936): 435

Type material examined. Paratype 1♂ (ZMH 61373) (Fig. 76). “Paratypus // ? / 28.7.? // Sammlung / Gustav Meyer // *Procris / alpina* Alb. / m / det.B.Alberti // ZMH 61373”

Type locality. ‘Südtirol, Stifser-Joch-Straße, Franzenshöhe, 2000 m [Italy, province Bozen/Bolzano].

Current status. Valid species.

77. *Adscita statices drenowskii* (Alberti, 1939)

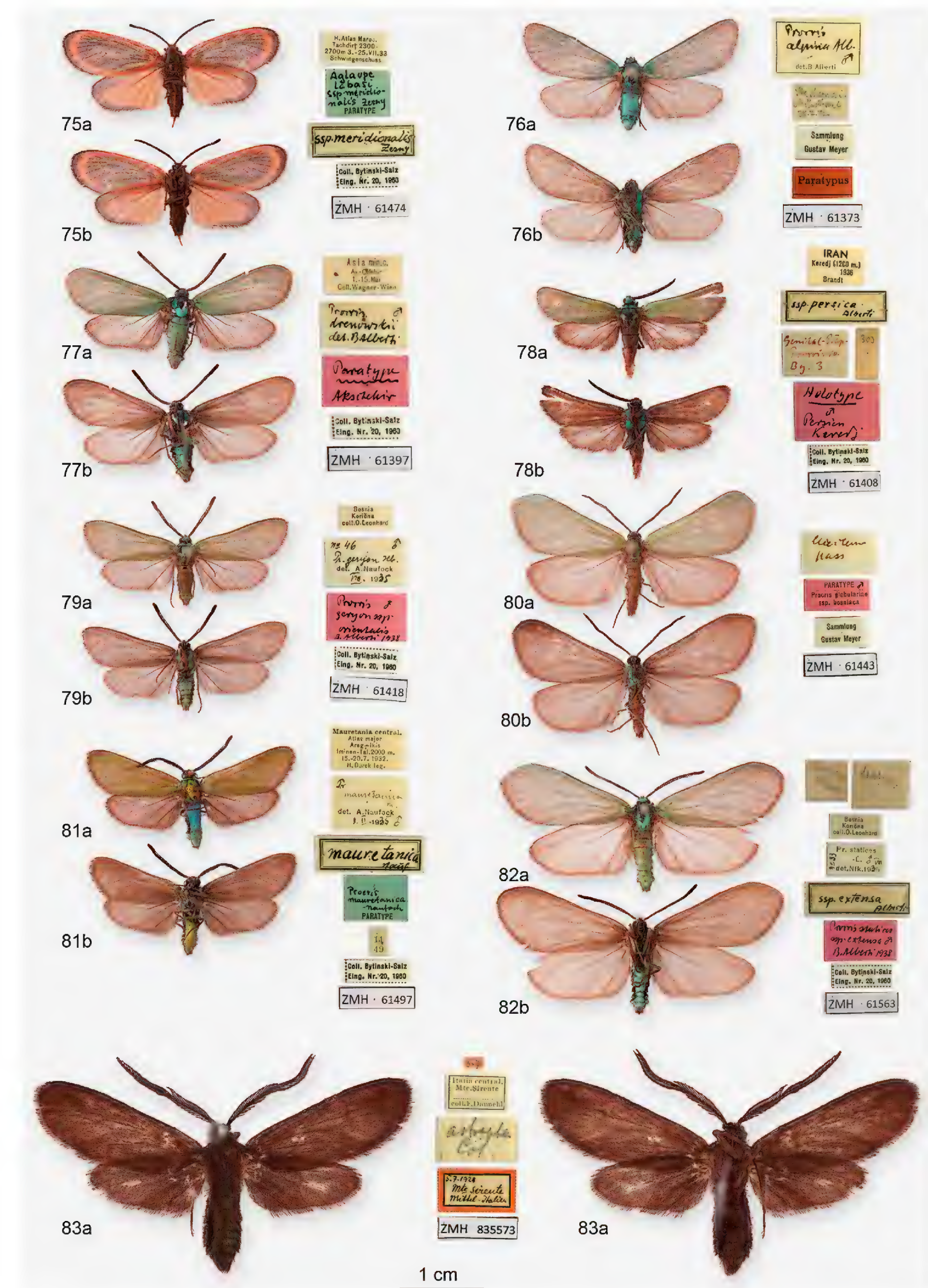
Procris drenowskii Alberti, 1939: Izv. Tsarsk. Prirod. Inst. Sofia 12: 43.

Type material examined. Paratypes 3♂♂ (ZMH 61397–ZMH 61399) (Fig. 77). “Asia min.c. / Ak-Chehir / 1.–15. Mai / Coll. Wagner-Wien // *Procris* m / *drenowskii* / det. B.Alberti // Paratype / Akschekir // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61397”; “Asia min.c. / Ak-Chehir / 1.–15.Mai / Coll. Wagner-Wien // *Procris* m / *drenowskii* / det. B. Alberti // *Procris* m / *drenowskii* / det. B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61398”; “Asia min. c. / Ak-Chehir / 1.–10.Juni 28 / Coll. Wagner-Wien // f *Procris* / abscirra Z. ? / det. A. Naufock / 4. 1. 1929 // *Procris* m / *drenowskii* / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61399”.

Type locality. Greece: Chalkidiki, Athos.

Current status. Valid subspecies.

Remarks. Alberti (1939) proposed this name as a new species of *Procris*. This taxon was subsequently downgraded to subspecific rank (Daniel, Forster and Osthelder 1951).



Figures 75–83. 75. *Aglaope labasi meridionalis* Zerny, 1934; 76. *Adscita alpina* (Alberti, 1937); 77. *Adscita statice drenowskii* (Alberti, 1939); 78. *Jordanita graeca persica* (Alberti, 1938); 79. *Adscita geryon orientalis* (Alberti, 1938); 80. *Jordanita (Jordanita) globulariae bosniaca* (Alberti, 1937); 81. *Procris mauretanica* Naufock, 1932; 82. *Procris statice extensa* Alberti, 1937; 83. *Theresimima ampellophaga* ab. *astrapta* Dannehl, 1933.

78. *Jordanita graeca persica* (Alberti, 1938)

Procris graeca persica Alberti, 1938: Mit. der Mün. Ent. G. 27: 125.

Type material examined. Holotype 1♂ (ZMH 61408) (Fig. 78) Allotype 1♀ (ZMH 61409) Paratypes 2♂♂ (ZMH 61410–ZMH 61411). “Keredi / 1800 256b // IRAN / Keredj (1200m.) / 1936 / Brandt // 303 // ssp. *persica* / Alberti // Senikl-Präp- / *Procris* No / By. 3 // Holotype / m / Persien / Keredj // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61408”; “IRAN / Keredj (1200m.) / 1936 / Brandt // 1800 / 146 // *Procris gracia* / f / det. B. Alberti // Allotype / Persien / Keredj // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61409”; “Iran // *Procris gracia* / ssp. *persica* / B. Alberti / 1937 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61410”; “Iran // Paratype / m / Persien / Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61411”.

Type locality. Iran, Keredj [Karaj, Alborz province].

Current status. Valid subspecies.

Remarks. Alberti (1938a) proposed this name as subspecies of *P. graeca* Jordan, 1907, that is considered a valid subspecies name.

79. *Adscita geryon orientalis* (Alberti, 1938)

Procris geryon orientalis Alberti, 1938: Z. für Natur., Halle a. S. 92: 54.

Type material examined. Paratypes 25♂♀ (ZMH 61418–ZMH 61442) (Fig. 79). “Bosnia / Korićna / coll. O. Leonhard // no 46 m / *Pr. geryon* Hb. / det. A. Naufock / VIII 1935 // *Procris m / geryon* ssp. / *orientalis* / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61418”; “Bosnia 1904 / Korićna / 8.7 / O. Leonhard // no 50 f / *Pr. geryon* Hb. / det. A. Naufock / VIII 1935 // *Procris geryon* / ssp. *orientalis* / B. Alberti 1938 f // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61419”; “Bosnia / Maklen Pass / coll. O. Leonhard // no 70 m / *Pr. geryon* HG. / det. A. Naufock / VIII 1935 // *Procris m / geryon* ssp. / *orientalis* / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61420”; “Bosnia / Maklen Pass / coll. O. Leonhard // no 64 m / *Pr. geryon* HG. / det. A. Naufock / VIII 1935 // *Procris m / geryon* ssp. / *orientalis* / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61421”; “Bosnia / Maklen Pass / coll. O. Leonhard // no 77 m / *Pr. geryon* HG. / det. A. Naufock / VIII 1935 // *Procris m / geryon* ssp. / *orientalis* / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61422”; “Bosnia / Maklen Pass / coll. O. Leonhard // no 69 m / *Pr. geryon* HG. / det. A. Naufock / VIII 1935 // *Procris m / geryon* ssp. / *orientalis* / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61423”; “Velebit Ostaria / 6.7. / M.Hilf 1910 / Coll. O. Leonhard // no 81 m / *Pr. geryon* HG. / det. A. Naufock / VIII 1935 // *Procris m / geryon* ssp. / *orientalis* / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61424”; “Velebit Ostaria / 6.7. / M.Hilf 1910 / Coll. O. Leonhard // no 82 f / *Pr. geryon* HG. / det. A.

Naufock / VIII 1935 // *Procris geryon* / ssp. *orientalis* f / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61425”; “Bosnia 1904 / Korićna / 10.7 / O. Leonhard // no 51 f / *Pr. geryon* Hb. / det. A. Naufock / VIII 1935 // *Procris geryon* / ssp. *orientalis* / B. Alberti f / 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61426”; “Bosnia / Korićna / coll. O. Leonhard // no 43 m / *Pr. geryon* Hb. / det. A. Naufock / VIII 1935 // *Procris m / geryon* ssp. / *orientalis* / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61427”; “Bosnia / Maklen Pass / coll. O. Leonhard // no 60 f / *Pr. geryon* HG. / det. A. Naufock / VIII 1935 // *Procris geryon* / ssp. *orientalis* f / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61428”; “Bosnia 1904 / Korićna / 8.7 / O. Leonhard // no 49 m / *Pr. geryon* Hb. / det. A. Naufock / VIII 1935 // *Procris geryon* ssp. / *orientalis* / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61429”; “Bosnia / Maklen Pass / coll. O. Leonhard // no 71 m / *Pr. geryon* HG. / det. A. Naufock / VIII 1935 // *Procris m / geryon* ssp. / *orientalis* / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61430”; “Bosnia / Korićna / coll. O. Leonhard // no 55 f / *Pr. geryon* Hb. / det. A. Naufock / VIII 1935 // *Procris geryon* / ssp. *orientalis* f / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61431”; “Bosnia 1904 / Korićna / 10.7 / O. Leonhard // no 52 f / *Pr. geryon* Hb. / det. A. Naufock / VIII 1935 // *Procris geryon* / ssp. *orientalis* f / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61432”; “Velebit Ostaria / 18.6 / M.Hilf 1910 / Coll. O. Leonhard // no 80 m / *Pr. geryon* HG. / det. A. Naufock / VIII 1935 // *Procris m / geryon* ssp. / *orientalis* / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61433”; “Bosnia / Korićna / coll. O. Leonhard // no 54 f / *Pr. geryon* Hb. / det. A. Naufock / VIII 1935 // *Procris geryon* / ssp. *orientalis* / B. Alberti 1938 f // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61434”; “? // Bosnia / Korićna / coll. O. Leonhard // no 59 f / *Pr. geryon* Hb. / det. A. Naufock / VIII 1935 // *Procris geryon* / ssp. *orientalis* f / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61435”; “Bosnia / Maklen Pass / coll. O. Leonhard // no 68 m / *Pr. geryon* HG. / det. A. Naufock / VIII 1935 // *Procris m / geryon* ssp. / *orientalis* / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61436”; “Bosnia / Korićna / coll. O. Leonhard // no 44 m / *Pr. geryon* Hb. / det. A. Naufock / VIII 1935 // *Procris m / geryon* ssp. / *orientalis* / B. Alberti 1938 // ssp. *orientalis* / Alb. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61437”; “Bosnia / Korićna / coll. O. Leonhard // no 58 f / *Pr. geryon* Hb. / det. A. Naufock / VIII 1935 // *Procris m / geryon* ssp. / *orientalis* / B. Alberti 1938 // ssp. *orientalis* / Alb. // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61438”; “Bosnia / Korićna / 10.7 / O. Leonhard // no 53 f / *Pr. geryon* Hb. / det. A. Naufock / VIII 1935 // *Procris geryon* / ssp. *orientalis* / B. Alberti 1938 f // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61439”; “Bosnia / Korićna / coll. O. Leonhard // no 57 f / *Pr. geryon* Hb. / det. A. Naufock / VIII 1935 // *Procris geryon* / ssp. *orientalis* f / B. Alberti

1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61440”; “Bosnia / Korićna / coll. O. Leonhard // no 45 m / *Pr. geryon* Hb. / det. A. Naufock / VIII 1935 // *Procris* m / *geryon* ssp. / *orientalis* / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61441”; “Bosnia / Maklen Pass / coll. O. Leonhard // no 65 m / *Pr. geryon* HG. / det. A. Naufock / VIII 1935 // *Procris* m / *geryon* ssp / *orientalis* / B. Alberti 1938 // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61442”.

Type locality. ‘Maklenpaß’ [Bosnia and Herzegovina: Maklen Pass].

Current status. Valid subspecies.

Remarks. Alberti (1938b) proposed this name as a subspecies of *A. geryon* (Hübner, 1813), that is considered a valid subspecies name.

80. *Jordanita (Jordanita) globulariae bosniaca* (Alberti, 1937)

Procris globulariae bosniaca Alberti, 1937: Int. Ent. Z. 51: 99

Type material examined. Paratypes 17♂♀ (ZMH 61443–ZMH 61459) (Fig. 80). “PARATYPE m / *Procris globulariae* / ssp. *bosniaca* // ? // Sammlung / Gustav Meyer // ZMH 61443”; “Velebit Ostaria / 6.7. / M. Hilf 1910 / Coll. O. Leonhard // no 84 Procris / cognata K.S. m / det. A. Naufock / 1935. VIII. // ssp. *bosniaca* / Alberti // *Procris globulariae* / ssp. *bosniaca* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61444”; “Bosnia 1904 / Korićna 10.7 / O. Leonhard // no 19 f / *Pr. cognata* HS. / det. A. Naufock / VIII.1935 // *Procris globulariae* / ssp. *bosniaca* f / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61445”; “Bosnia / Korićna / coll. O. Leonhard // no 8 f / *Pr. cognata* H.S. / det. A. Naufock / VIII 1935 // *Procris globulariae* / ssp. *bosniaca* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61446”; “Bosnia 1904 / Korićna 28.7 / O. Leonhard // no 20 f / *Pr. cognata* HS. / det. A. Naufock / VIII.1935 // *Procris globulariae* / ssp. *bosniaca* f / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61447”; “Bosnia / Korićna / coll. O. Leonhard // no 6 m / *Pr. cognata* HS. / det. A. Naufock / VIII.1935 // *Procris globulariae* / ssp. *bosniaca* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61448”; “Bosnia / Korićna / coll. O. Leonhard // no 10 m / *Pr. cognata* HS. / det. A. Naufock / VIII.1935 // *Procris globulariae* / ssp. *bosniaca* / B. Alberti m // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61449”; “Bosnia / Korićna / coll. O. Leonhard // no 11 m / *Pr. cognata* HS. / det. A. Naufock / VIII.1935 // *Procris globulariae* / ssp. *bosniaca* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61450”; “Bosnia / Korićna / coll. O. Leonhard // no 16 / *Pr. cognata* HS. / det. A. Naufock / VIII.1935 // *Procris globulariae* / ssp. *bosniaca* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61451”; “Bosnia / Korićna / coll. O. Leonhard // no 13 m / *Pr. cognata* HS. / det. A. Naufock / VIII.1935 // *Procris globulariae*

/ ssp. *bosniaca* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61452”; Bosnia / Korićna / O. Leonhard // no 17 m / *Pr. cognata* HS. / det. A. Naufock / VIII.1935 // *Procris globulariae* / ssp. *bosniaca* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61453”; “Bosnia / Korićna / coll. O. Leonhard // no 14 / *Pr. cognata* HS. / det. A. Naufock / VIII.1935 // *Procris globulariae* / ssp. *bosniaca* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61454”; “Bosnia / Korićna / coll. O. Leonhard // no 7 m / *Pr. cognata* HS. / det. A. Naufock / VIII.1935 // *Procris globulariae* / ssp. *bosniaca* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61455”; “Bosnia / Korićna / coll. O. Leonhard // no 12 m / *Pr. cognata* HS. / det. A. Naufock / VIII.1935 // *Procris globulariae* / ssp. *bosniaca* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61456”; “Bosnia / Korićna / coll. O. Leonhard // no 15 m / *Pr. cognata* HS. / det. A. Naufock / VIII.1935 // *Procris globulariae* / ssp. *bosniaca* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61457”; “Bosnia 1904 / Korićna 10.7 / O. Leonhard // no 18 m / *Pr. cognata* HS. / det. A. Naufock / VIII.1935 // *Procris globulariae* / ssp. *bosniaca* / B. Alberti m // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61458”; “Bosnia / Korićna / coll. O. Leonhard // no 9 m / *Pr. cognata* HS. / det. A. Naufock / VIII.1935 // *Procris globulariae* / ssp. *bosniaca* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61459”.

Type locality. ‘Korićna’ [Bosnia and Herzegovina: Korićna].

Current status. Invalid subspecific name. Synonym of *Jordanita (Jordanita) globulariae globulariae* (Hübner, 1793).

Remarks. Alberti (1937c) proposed this name as subspecies of *Procris globulariae* Hübner (1793). The name was subsequently synonymized. The current combination is *Jordanita (Jordanita) globulariae globulariae* (Hübner, 1793) (Efetov and Tarmann 1995).

81. *Procris mauretanica* Naufock, 1932

Procris mauretanica Naufock, 1932: Z. Öst. Ent. Ver. 17: 77

Type material examined. Paratypes 2♂♂ (ZMH 61497–ZMH 61498) (Fig. 81). “Mauretania central. / Atlas major / Areg-Ikis / Iminem-Tal.2000 m. / 15.–20.7.1932. / H. Gürck leg. // *Pr. mauretanica* / m. / det. A. Naufock / 1.II.1935 m // ZMH 61497 // *Procris* / *mauretanica* / Naufock / PARATYPE // *mauretanica* / Nauf // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // 11 / 49”; “Mauretania central. / Atlas major / Areg-Ikis / Iminem-Tal.2000 m. / 15.–20.7.1932. / H. Gürck leg. // *mauretanica* / ? // *Procris* / *mauretanica* / Naufock / PARATYPE // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // 12 / 52 // ZMH 61498”.

Type locality. ‘Französisch Marokko, Aiin Leuh, Sefrou’ [Morokko: Moyen Atlas, Ain Leuh and Sefrou].

Current status. Valid species.

82. *Procris statices extensa* Alberti, 1937

Procris statices extensa Alberti, 1937c: Int. Ent. Z. 51: 100

Type material examined. Paratypes 9♂♀ (ZMH 61560–ZMH 61568) (Fig. 82). “Transsylvania / ex coll. / Neuburger // *Pr. statices* / no 35 / L. m / det. Nfk.19VIII5 // 104 // *Procris statices* / ssp. *extensa* f / B. Alberti ? // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61560”; “mwv? / 117 a // Bosnia / Maklen Pass / coll. O. Leonhard // *Pr. statices* / no 30 / L. m / det. Nfk.1935 VIII // *Procris statices* / ssp. *extensa* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61561”; „Kuriém / 46609 // Italien // Bosnia / Korićna / coll. O. Leonhard // *Pr. statices* / no 33 / L. m / det. Nfk.1935 VIII // *Procris statices* / ssp. *extensa* m / B. Alberti 1938 // ssp. *extensa* / Alberti / ZMH 61563”; “mwv? / 1017 w // *Pr. statices* / no 29 / L. m / det. Nfk.1935 VIII // Bosnia / Maklen Pass / coll. O. Leonhard // *Procris statices* ssp. *extensa* / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61564”; “Italien // Bosnia / Maklen Pass / coll. O. Leonhard // *Pr. statices* / no 26 / L. m / det. Nfk.1935 VIII // *Procris statices* / ssp. *extensa* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61565”; “? // Bosnia / Korićna / coll. O. Leonhard // *Pr. statices* / no 34 / L. f VIII / det. Nfk.1935 // *Procris statices* ssp. / *extensa* f / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61566”; “? // Bosnia / Maklen Pass / coll. O. Leonhard // *Pr. statices* / no 28 / L. m VIII / det. Nfk.1935 // *Procris statices* / ssp. *extensa* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61567”; “Jno Sda – / Lias Z / masu 27/6.Tz // *Pr. statices* / no 28 / L. m VIII / det. Nfk.1935 // *Procris statices* / ssp. *extensa* m / B. Alberti // Coll. Bytinski-Salz / Eing. Nr. 20, 1960 // ZMH 61568”.

Type locality. ‘Maklenpaß’ [Bosnia and Herzegovina: Maklen Pass].

Current status. Invalid subspecies name. Synonym of *Adscita* (*Adscita*) *statices statices* (Linnaeus, 1758).

Remarks. This taxon was subsequently synonymized. The current combination is *Adscita* (*Adscita*) *statices statices* (Linnaeus, 1758) (Efetov and Tarmann 1995).

83. *Theresimima ampellophaga* ab. *astrapta* Dannehl, 1933

Ino ampellophaga ‘ab. (?) rasse (?) astrapta Dannehl, 1933: Entomologische Zeitschrift. Frankfurt a. M. 47: 147

Original material examined. Labelled as “Cotype” 1♂ (ZMH 835573) (Fig. 83). “57 // Italia central. / Mte. Sirente / coll. F. Dannehl // *astrapta* / Col. // 5.7.1928 / mte sirente / Mittel-Italien // ZMH 835573”.

Original locality. ‘Sabiner Berge, c. 500 m’ [Italy: Latio, Rieti, Monte Sabini].

Current status. Infrasubspecific and hence unavailable name.

Remarks. Dannehl (1933) proposed this name as an aberration of *Theresimima ampellophaga* Bayle-Barelle, 1808. Therefore, it is deemed to be infrasubspecific, it is hence unavailable (Article 45.6.2, ICZN 1999).

Discussion

More than 2,000 type specimens of butterflies and moths (Lepidoptera) are deposited in the Zoological Museum of Hamburg (ZMH). In this catalogue, we have listed 259 “type” specimens: 13 valid species names, 34 subspecies (16 valid and 18 invalid names), and 36 invalid infrasubspecific rank under the ICZN code. Of these 259 specimens, 81 are primary types, 92 are secondary types, and 86 are considered invalid infrasubspecific rank (Suppl. material 1: Table S1).

Comparison of the first part of our updated catalogue to the type catalogue of Weidner (1974) reveals 32 new additions to the families Sesiidae, Brachodidae, Metarbelidae, and Zygaenidae (Suppl. material 1: Table S1). New additions to the type collection since the Weidner catalogue (1974) do not necessarily reflect “new type additions” – except for the five taxa donated by Kallies and Bartsch (Sesiidae and Brachodidae), and Lehmann (Metarbelidae) to the ZMH collection – they were found among the existing type material and were either mididentified or misplaced under the incorrect type labels. Details of the changes and updates including the new types, changes to the type status, and changes to the specimen counts since the last catalogue of Weidner (1974) were summarized in Suppl. material 1: Table S1.

The collection of Dr. Hanan Bytinski-Salz was the largest collection containing the most “type specimens” mainly from Hugo Reiss (89 specimens), Burchard Alberti (59 specimens) and Hanan Bytinski-Salz (35 specimens). None of the specimens from the latter author represents a valid name. The oldest type specimen was from the collection of Bytinski-Salz described by Korb in 1903 (*Zygaena rosinae* Korb, 1903).

Acknowledgements

This project was funded by the CeNak “Digitalisierung der CeNak-Sammlungen”. We also like to thank HASPA Lotterie Sparen for funding boxes and the City of Hamburg for further funding via Bussgeldfonds. We thank Dr. Henrik Kusche (Leitung Sammlungsmanagement/Digitalisierung) and the Gesellschaft der Freunde und Förderer des Zoologischen Museums Hamburg for providing financial support to the collections. For help with the search of rare literature we thank Mag. Harald Bruckner and Dr. Sabine Gaal (both Naturhistorisches Museum Wien, Austria), Mag. Ursula Grimm (Tiroler Landesmuseen, Ferdinandeum, Innsbruck, Austria) and Prof. Dr. Predrag Jakšić (Belgrade, Serbia). We are extremely grateful to Axel Hofmann (ABL – Arten Biotope Landschaft – Bürogemeinschaft für Landschaftsökologie, Freiburg, Germany) for his constructive and fruitful comments with the difficult taxa (unpublished and unavailable names). The authors also acknowledge the members of the other Zoological Collections at the CeNak for their patience during our intensive photography sessions. Comments by Alberto Zilli, Wolfgang Naesig, Roman Yakovlev, and Karen McLachlan Hamilton substantially improved the manuscript.

References

- Alberti B (1937/1938a) Revision und Neubeschreibungen asiatischer *Procris*-Arten. Mitteilungen der Münchner Entomologischen Gesellschaft 27: 67–101. [116–126.]
- Alberti B (1937c) Beitrag zur Kenntnis der Gattung *Procris* nebst Beschreibung einer neuen Art. Int. Ent. Z. 51: 86–89. [98–100.]
- Alberti B (1938b) Entwicklungs- und verbreitungsgeschichtliche Betrachtungen mit besonderer Berücksichtigung der mitteldeutschen Zygaeniden (Lepidoptera). Zeitschrift für Naturwissenschaften, Halle a. S. 92: 35–65.
- Alberti B (1939) Eine neue Schmetterlingsart – *Procris drenowskii* nov. spec. – aus Bulgarien. Izv. Tsarsk. Prirod. Inst. Sofia 12: 43–47.
- Burgeff H (1914) Kommentar zum paläarktischen Teil der Gattung *Zygaena* des von Chr. Aurivillius und H. Wagner herausgegebenen Catalogus Lepidopterorum. Mitteilungen der Münchner Entomologischen Gesellschaft 5: 35–70.
- Burgeff H (1926) Kommentar zum paläarktischen Teil der Gattung *Zygaena* Fab. des früher von Chr. Aurivillius und H. Wagner jetzt von E. Strand herausgegebenen Catalogus Lepidopterorum. – Mitteilungen der Münchner Entomologischen Gesellschaft 16: 1–86.
- Burgeff H (1927) Zygaenidae. In: Bang-Haas O (Ed.) Horae Macrolepidopt. Reg. Palaearct 1: 55–57.
- Bytinski-Salz H (1936) New Heterocera from Asia Minor. The Entomologist's Record and Journal of Variation 48 (Suppl.): (1)–(6).
- Bytinski-Salz H (1937) Secondo contributo alla conoscenza della Lepidotterofauna della Sardegna. Memorie della Società Entomologica Italiana 15(1936): 194–212.
- Bytinski-Salz H (1939) New and little known forms of *Hepialus* mostly from Great Britain. Entomologist's Record and Journal of Variation 51: 81–85.
- Dannehl F (1932) Neue Schmetterlingsformen und -Arten aus Marasch in Nordsyrien. – Mitteilungen der Münchner Entomologischen Gesellschaft 22: 15–16.
- Dannehl F (1933) Neues aus meiner Sammlung (Makrolepidoptera). Entomologische Zeitschrift. Frankfurt a. M. 47: 19–20. [25–26, 32–33, 81–82, 87–88, 105–106, 123–124, 139–140, 146–147.]
- Dey L-S, Husemann M (2018a) An annotated catalogue of the types of bush-cricket and crickets (Orthoptera, Ensifera) housed in the Zoological Museum Hamburg (ZMH). Evolutionary Systematics 2: 115–124. <https://doi.org/10.3897/evolsyst.2.27030>
- Dey L-S, Husemann M (2018b) An annotated catalogue of the types of short-horned grasshoppers (Orthoptera, Caelifera) housed in the Zoological Museum Hamburg (ZMH). Evolutionary Systematics 2: 21–30. <https://doi.org/10.3897/evolsyst.2.22127>
- Dziurzynski C (1913) Neue Formen von der Gattung *Zygaena* F. Jahresbericht des Wiener Entomologischen Vereins 23(1912): e215.
- Edwards ED, Gentili P, Horak M, Kristensen NP, Nielsen ES (1998) „11. The Cossoid/Sesioid Assemblage“. Band 4: Arthropoda, 2 Hälfte: Insecta, Lepidoptera, Moths and Butterflies, Teilband/Part 35, Volume 1: Evolution, Systematics, and Biogeography, 181–198. <https://doi.org/10.1515/9783110804744.181>
- Efetov KA, Tarmann GM (1995) An annotated check-list of the Palaearctic Procrinae (Lepidoptera: Zygaenidae), with descriptions of new taxa. Entomologi Gazette 46: 63–103.
- Efetov KA (2001) An annotated check-list of Forester moths (Lepidoptera: Zygaenidae, Procrinae). Entomologi Gazette 52: 153–162.
- Efetov KA, Hofmann A, Tarmann GM, Tremewan WG (2014) Taxonomic comments on the treatment of the Zygaenidae (Lepidoptera) in volume 3 of Moths of Europe, Zygaenids, Pyralids 1 and Brachodids (2012). Nota Lepidopterologica 37(2): 123–133. <https://doi.org/10.3897/nl.37.7940>
- Efetov KA, Tarmann GM (2017) The hypothetical ground plan of the Zygaenidae, with a review of the possible autapomorphies of the Procrinae and the description of the Inouelinae subfam. nov. Journal of the Lepidopterists' Society 71: 20–49. <https://doi.org/10.18473/lepi.v71i1.a5>
- Epstein MC, Gertsema H, Naumann CM, Tarmann GM (1998) The Zygaenoidea. In: Kristensen NP (Ed.) Lepidoptera: Moths and Butterflies 1. Handbuch der Zoologie/Handbook of Zoology IV/35, Walter de Gruyter, Berlin & New York, 159–180. <https://doi.org/10.1515/9783110804744.159>
- Glaubrecht M (2018) Back to the future: The Centrum für Naturkunde on its way toward re-establishing a Natural History Museum in Hamburg. In: Beck LA (Ed.) Zoological Collections of Germany – The animal Kingdom in its Amazing Plenty at Museums and Universities. Springer International, Cham, 435–461. https://doi.org/10.1007/978-3-319-44321-8_35
- Harms D, Duperré N (2018) An annotated type catalogue of the camel spiders (Arachnida: Solifugae) held in the Zoological Museum Hamburg. Zootaxa 4375: 1–58. <https://doi.org/10.11646/zootaxa.4375.1.1>
- Henningsen M, Peitzner G, Peitzner P, Husemann M (2020) An updated checklist of type material of dragonflies and damselflies (Odonata) housed in the Zoological Museum Hamburg (ZMH), Germany. Evolutionary Systematics 4(1): 53–60. <https://doi.org/10.3897/evolsyst.4.48407>
- Hofmann A, Tremewan WG (1996) A Systematic Catalogue of the Zygaeninae (Lepidoptera: Zygaenidae). Harley Books, Colchester, 251 pp.
- Holik O (1932) Polnische und ukrainische Zygaenen. Dt. Ent. Z. Iris 26: 109–135.
- Holik O (1935) *Zygaena exulans* var. *polaris* m. (nov. var.) und *Zyg. exulans* ssp. *vanadis*. Dalm. Ent. Tisdkr 56: 47–51.
- ICZN (1999) International Code of Zoological Nomenclature. Fourth edition. International Trust for Zoological Nomenclature, London. <http://www.iczn.org/iczn/index.jsp> [Accessed: 23 Feb. 2021]
- Görgner E, Hofmann A (1982) Eine neue Zygaenenart für die Türkei (Lepidoptera; Zygaenidae, *Zygaena* Fabricius, 1775, Subgenus *Mesembrynus* Hübner, [1819]). Entomofauna 3: 33–54.
- Kallies A (1998) Erster Beitrag zur Kenntnis der palaarktischen Brachodidae: Revision von *Brachodes fallax* mit Beschreibungen neuer zentralasiatischer Arten. Nota Lepidopterologica 21: 170–193.
- Keil T (2003) Attend [sic] for a new classification of the taxa around *Zygaena rubricollis* Hampson, 1900 (Lepidoptera: Zygaenidae, Zygaeninae). Abstracts of the VIII International Symposium on Zygaenidae, Dresden – Germany, 10–14 September 2003: 31–32.
- Koch M (1938) *Zygaena angelicae* Ochs. Z. Öst. Ent. Ver. 23: 15–19.
- Lehmann I (2019) First revision of the family Metarbelidae Strand, 1909 (Lepidoptera, Cossoidea Leach, 1815) and a phylogeny based on adult morphology of 60 genera from the Afrotropical and Oriental Region. Doctoral Dissertation, 1–398, Rheinische Friedrich-Wilhelms-Universität Bonn. Universitäts- und Landesbibliothek Bonn. urn:nbn:de:hbz:5n-55423 [published 19th August 2019]
- Monod L, Duperre N, Harms D (2019) An annotated catalogue of the scorpion types (Arachnida, Scorpiones) held in the Zoological Museum Hamburg. Part I: Parvorder Iurida Söglad & Fet, 2003. Evolutionary Systematics 3(2): 109–200. <https://doi.org/10.3897/evolsyst.3.37464>

- Naumann CM (1982) Zur Kenntnis der von Manfred Koch beschriebenen Taxa des *Zygaena-purpuralis*-Komplexes (Lepidoptera, Zygaenidae). Entomofauna 3(16): 225–241.
- Nielsen ES, Robinson GS, Wagner DL (2000) Ghost-moths of the world: a global inventory and bibliography of the Exoporia (Mnesarchaeoidea and Hepialoidea) (Lepidoptera). Journal of Natural History 34: 823–878. <https://doi.org/10.1080/002229300299282>
- Reiss H (1922) *Zygaena*. Beschreibung neuer Rassen. Int. Ent. Z. 16: 65–67, 83–84.
- Reiss H (1932a) Altes und Neues über *Zygaena corycia* Stgr., *Z. graslini* Led., *Z. cambysea* Led. und *Z. cuvieri* Boisd. (Lep.). Int. Ent. Z. 26: 269–280.
- Reiss H (1932b) *Zygaena ephialtes kiewensis* Reiss. In: Holik, O. 1932. Polnische und ukrainische Zygaenen. Dt. Ent. Z. Iris 26: 109–135.
- Reiss H (1932c) Ein Ausschnitt über *Zygaena fausta* Linné und deren Nominatrasse (Lep.) Internationale Entomologische Zeitschrift 26: 221–230.
- Reiss H (1935c) Neues über asiatische Zygaenen, im besonderen die Zygaenen-Fauna von Ak-Schehir in Kleinasien. Int. Ent. Z. 29: 121–124. [139–142, 149–151, 159–161, 186–192, 207–209, 221–223, 229–232.]
- Reiss H (1936) Neue Bausteine zur Zygaenenfauna der Pyrenäenhalbinsel. Entomologische Rundschau 54: 28–30. [57–60, 71–76, 88–92.]
- Reiss H (1941) Über einige neue europäische und asiatische Zygaenenrassen (Lep.). Z. Wien. Ent. Ver. 26: 58–64.
- Reiss H (1958) Deuxième contribution à la faune des Lépidoptères, en particulier des Zygaenae des Alpes-Martimes. Bulletin de la Société entomologique de Mulhouse 1958: 45–63.
- Reiss H, Tremewan WG (1967) A systematic catalogue of the genus *Zygaena* Fabricius (Lepidoptera: Zygaenidae). W. Junk, Den Haag, 329 pp. <https://doi.org/10.1007/978-94-011-8001-6>
- Rocci U (1936) Ricerche sulle forme del gen. *Zygaena* F. (Lepidopt., Zygaenidae). Redia 22: 131–142.
- Sartori M, Kubiak M, Rajaei H (2016) An updated list of type material of Ephemeroptera Hyatt & Arms, 1890, deposited at the Zoological Museum of Hamburg (ZMH). ZooKeys 607: 49–68. <https://doi.org/10.3897/zookeys.607.9391>
- Sicher A (1906) Eine neue Aberration von *Zygaena transalpina*. Esp. Jber. Wien. Ent. Ver. 16(1905): e91.
- Simões MVP, Husemann M, Sekerka L (In press) A catalogue of the tortoise-beetle (Chrysomelidae, Cassidinae) collection deposited in the Zoological Museum Hamburg (ZMH) – types and new distribution records. Evolutionary Systematics.
- Stauder H (1921) Neue Zygaenenformen aus Südtalien. Neue Beiträge zur Systematischen Insektenkunde 2: 30–31.
- van Nieukerken EJ, Kaila L, Kitching IJ, Kristensen NP, Lees DC, Minet J, Mitter C, Mutanen M, Regier JC, Simonsen TJ, Wahlberg N, Yen S-H, Zahiri R, Adamski D, Baixeras J, Bartsch D, Bengtsson BÅ, Brown JW, Bucheli SR, Davis DR, De Prins J, De Prins W, Epstein ME, Gentili-Poole P, Gielis C, Hättenschwiler P, Hausmann A, Holloway JD, Kallies A, Karsholt O, Kawahara AY, Koster SJC, Kozlov MV, Lafontaine JD, Lamas G, Landry J-F, Lee S, Nuss M, Park K-T, Penz C, Rota J, Schintlmeister A, Schmidt BC, Sohn J-C, Solis MA, Tarmann GM, Warren AD, Weller S, Yakovlev RV, Zolotuhin VV, Zwick A (2011) Order Lepidoptera Linnaeus, 1758. Zootaxa 3148: 212–221. <https://doi.org/10.11646/zootaxa.3148.1.41>
- Vegliante F, Zilli A (2004) Larval morphology of Heterogynis (Lepidoptera: Heterogynidae). European Journal of Entomology 101: 165–184. <https://doi.org/10.14411/eje.2004.021>
- Weidner H (1979) Die Entomologischen Sammlungen des Zoologischen Staatsinstituts und Zoologischen Museums Hamburg, Nachtrag zum IX. Teil: Insecta VI. Mitteilungen Hambg. Zoologisches Institut und Museum 76: 395–468.
- Weidner H (1974) Die Entomologischen Sammlungen des Zoologischen Instituts und Zoologischen Museums der Universität Hamburg, XI. Teil, Insecta VIII. Mitteilungen aus dem Hamburgischen Zoologischen Institut und Museum 70: 181–266.
- Weidner H (1962) Die Entomologischen Sammlungen des Zoologischen Staatsinstituts und Zoologischen Museums Hamburg, IV. Teil, Insecta I. Mitteilungen aus dem Hamburgischen. Zoologisches Institut und Museum 60: 81–109.
- Yakovlev RV (2011) Catalogue of the Family Cossidae of the Old World. Neue Entomol. Nachrichten 66: 1–129.
- Yakovlev RV, Witt TJ (2017) Taxonomic notes about Paropta Staudinger, 1899 (Lepidoptera: Cossidae). Zoology in the Middle East 63(2): 166–171. <https://doi.org/10.1080/09397140.2017.1315858>
- Yakovlev RV, Zolotuhin V (2020) Revision of the family Metarbelidae (Lepidoptera) of the Oriental Region. I. Introduction and genera *Encaumaptera* Hampson 1893, *Orgyarbela* gen. nov., and *Hollowarbela* gen. nov. Ecologica Montenegrina 38: 84–101. <https://doi.org/10.37828/em.2020.38.11>

Supplementary material 1

List of the type specimens of Lepidoptera illustrated in catalogue I: superfamilies Hepialoidea, Cossioidea, and Zygaenoidea

Authors: Reza Zahiri, Gerhard Tarmann, Konstantin A. Efetov, Hossein Rajaei, Maryam Fatahi, Matthias Seidel, Birgit Jaenicke, Thure Dalsgaard, Marcy Sikora, Martin Husemann

Data type: Type specimens deposited in ZMH listed in catalogue I: superfamilies Hepialoidea, Cossioidea, and Zygaenoidea.

Copyright notice: This dataset is made available under the Open Database License (<http://opendatacommons.org/licenses/odbl/1.0>). The Open Database License (ODbL) is a license agreement intended to allow users to freely share, modify, and use this Dataset while maintaining this same freedom for others, provided that the original source and author(s) are credited.

Link: <https://doi.org/10.3897/evolsyst.5.62003.suppl1>